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Children and Familial Economic Welfare: The Effect of Income on Child Development

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by
Paul Roberts, Peter Smith and Holly Nason

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This report is part of a set of research studies on the National Longitudinal Survey of Children and Youth.
Le présent rapport fait partie d'un ensemble d'études sur l'Enquête longitudinale nationale sur les enfants et les jeunes.

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Abstract

Research in Canada and elsewhere has shown a link between economic disadvantage and a broad range of poor child developmental outcomes. Despite this research, however, the exact nature and strength of the relationship between a family's economic circumstances and their children's developmental outcomes is still open to debate. The aim of this paper is to examine only one aspect of the economic welfare of a family, namely, the impact that income has on children's development in Canada. Our study provides an initial assessment of the evidence of the effect of income on child development.

The paper addresses the following questions How much income fluctuation do children's families experience year to year, and of what magnitude are these fluctuations? What proportion of children spend time in low income situations? How long do children spend living in poverty? What proportion leave or enter low income situations? How important is income in affecting children's outcomes as described by cognitive and behavioural measures? Does income have a different effect on children at different ages or stages of development? What proportions of these income fluctuations are related to labour-market changes and to changes in family structure?

The study answers these questions with data drawn from the share file of the first two cycles (1994-1995 and 1996-1997) of the National Longitudinal Survey of Children and Youth (NLSCY). The researchers use cross-tabular analysis to observe the correlation between families' changing economic circumstances and children's developmental outcomes. Our results show the distribution of household income in each of the two cycles to be generally the same. This equivalence, however, hides broad income shifts that are correlated with changes in family structure and number of earners.

The analysis then proceeds to investigate the independent effect of income on child outcomes employing a typical reduced-form Ordinary Least Squares (OLS) regression model following Blau (1999) and Mayer (1997). The results demonstrate that the effect of income on children's behavioural and cognitive outcomes is for the most part significant, even after the application of controls, but is relatively small. This finding concurs with much of the previous research. Research literature has shown that income may affect children through their home environment. The authors construct a home- environment index, which is a preliminary proxy of the HOME psychometric scale measure used in previous American research. With this index, children from affluent families are shown to tend to have slightly better and more stimulating home environments than children from families with lower income.

The study concludes that, with only the two cycles of the NLSCY, one cannot yet determine the exact nature of the income and child-development link. The findings support the notion that the impact of income on children's development is weak to moderate for many of the child outcomes examined. However, the findings also suggest that, through a variety of variables, income does have an impact on children's development.

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Table of Contents

Foreword ix

1. Introduction 1

2. Literature Review 5

2.1 Family Income, Economic Circumstances and Child Outcomes 5

2.2 Family Structure Change, Economic Circumstances and Child Outcomes 9

2.3 Labour Market Changes, Employment and Child Outcomes 11

3. Methodological Considerations and Hypotheses 16

3.1 Sample Information and Descriptive Data Selection 16

3.2 Regression Model Data Selection 17

3.3 Regression Variable Description and Construction 18

3.3.1 Child Outcomes: Dependent Variables
3.3.2 Home Environment Dependent Variable
3.3.3 Independent Variables

3.4 Hypotheses 24

4. General Findings and Cross-Tabulations 25

4.1 Income, Poverty, Family Structure and Number of Earners Changes from 1994 to 1996 25

4.2 Income Changes and Child Outcomes 27

5. Income and Children's Outcomes – Empirical Findings from the Reduced Form Regression Model 31

5.1 Descriptive Statistics for the Independent Variables and Outcomes 31

5.1.1 Motor and Social Development
5.1.2 The Peabody Picture Vocabulary Test
5.1.3 Behaviour Scales
5.1.4 Math and Reading Scores

5.2 Regression Results for the Dependent Child Outcome Variables 33

5.2.1 Motor and Social Development Scores
5.2.2 The PPVT Scores
5.2.3 Behavioural Outcomes
5.2.4 Math and Reading Outcomes
5.2.5 Home Environment Proxies

6. Discussion 38

7. Policy Implications 41

8. Conclusion 43

Appendix Data Tables and Regression Results 45

Bibliography 63

Foreword

The National Longitudinal Survey of Children and Youth (NLSCY) is a unique Canadian survey designed to follow a representative sample of children from birth to early adulthood. It is conducted in partnership by Human Resources Development Canada (HRDC) and Statistics Canada. Statistics Canada is responsible for data collection, while HRDC, the major funder, directs and disseminates research. Data collection began in 1994 and continues at two-year intervals.

The survey for the first time provides a single source of data for the examination of child development in context, including the diverse life paths of normal development. The survey and the research program were developed to support evidence-based policy, using a human development view of the early decades of life. This research paper is part of an ongoing series of papers emanating from a program of research that examines NLSCY data collected in the first two cycles (1994, 1996) of the survey.

1. Introduction

Research in Canada and elsewhere has shown a link between economic disadvantage and a broad range of poor child developmental outcomes (Blau, 1999; Ross and Roberts, 1999; Duncan et al., 1998; McLoyd, 1998; Duncan and Brooks-Gunn, 1997; Mayer, 1997; Duncan et al., 1994). Lack of immediate as well as social or communal resources all contribute to the overall economic disadvantages faced by some families with children relative to other families. On the one hand, children in families with greater financial and economic resources generally have more secure living conditions and attachments, in addition to greater access to social, health, educational, and recreational opportunities – important factors shaping positive and healthy development. Children from low-income families, on the other hand, are at significant social, physical and emotional risk, especially for behavioural and emotional problems, and poor academic performance (Duncan et al., 1998 and Duncan et al., 1994). Despite this research, however, the exact nature and strength of the relationship between a family's economic circumstances and children's developmental outcomes is still open to debate (Blau, 1999; Mayer, 1997). Research regarding familial changes such as divorce, separations and remarriage, for example, suggests that these changes also have a direct effect on a family's economic circumstances as well as on children's outcomes (Jekielek et al., 1998; Thomson et al., 1994).

While it is the case that the exact relationship is still being debated, many researchers do contend that a child's welfare and development is connected in part to their family's level of economic welfare. A family's economic welfare in this sense encompasses its general level of income, employment related benefits, type of work and employment of those earners in the family, level and availability of services from the private and public sector, as well as the general economic conditions in the community. Indeed, the very different causes of change to a family's economic conditions open the possibility of very different policy initiatives to address the experiences of children as they development. Our aim in this project will be to examine only one aspect of the economic welfare of a family, namely the impact that income has on children's development in Canada.

Previous studies in Canada have been largely based on cross-sectional data (Ross and Roberts, 1999; Lefebvre and Merrigan, 1998; Lipman and Offord, 1997). This work has been useful in identifying the specific linear and non-linear effects of income for children, as well as those factors which serve as

either protective mechanisms or enhance children's developmental opportunities. But much remains to be done in understanding the effect of income and the experience of poverty (CCSD, Key Informant Study, 1999) on children's later development. We need to look at not only the level of income, but the dynamics or flows of income as well.

New sources of longitudinal survey information on children in Canada provide a starting point to allow a determination of the extent to which the level and stability of income is an important factor in shaping the life chances of children, and possible areas for public policy intervention. Unfortunately these surveys are still very much in their infancy. As more years and a greater number of cycles of information become available we will be able to obtain a more detailed picture of the relationship between a family's economic conditions and their children's development. Our study, therefore, provides only an initial assessment of the evidence of the effect of income and child development. As well, given the importance of other economic factors, we provide a preliminary examination of the effect of labour market changes (as measured by number of family earners) and changes in family composition (as measured by changes to two parent and lone parent status) on the behavioural outcomes of children. However, the main focus of our analysis will be on the effect of income, its level and stability on the development of children.

Governments at both the provincial and federal levels are struggling with the best way to ensure that all children in Canada realize their full potential. Knowing what to do is affected in part by an understanding of the experience and impact of income and changes in family income on children's development. To this end, and bearing in mind the limitations of the survey data, we address the following questions:

- How much income fluctuation and of what magnitude do children's families experience year to year?
- What proportion of children spend sometime in lower income situations? How long do children spend living in poverty? What proportion leave or enter lower income situations?
- How important is income in affecting children's outcomes as measured by cognitive and behavioural measures?

- Does income have a different effect on children at different ages or stages of development?
- What proportion of these income fluctuations are related to labour market changes and what proportion are related to changes in familial structure?

We answer these questions in our study, which is divided into ten sections, with data drawn from the share file of the first two cycles (1994-1995 and 1996-1997) of the National Longitudinal Survey of Children and Youth (NLSCY). We focus on the cohort of children aged from 2 to 13 years old in 1996 (ages 0 to 11 in 1994), yielding a sample of 15,266 children to investigate the research questions.[1] Section one introduces the study. The second section reviews the relevant literature regarding the effect that income security, change in family structure, and changes in familial employment, have on children's outcomes. It is followed by a discussion of the methodological issues and hypotheses to be tested. Our fourth section is an initial analysis of the economic security of families and how it affects children's outcomes. We measure a family's economic circumstances by observing changes in income, family structure, number of earners and child outcomes across the two cycles of the NLSCY. We then use cross-tabular analysis to observe the correlation between families' changing economic circumstances and children's developmental outcomes. Our results show the distribution of household income in each of the two cycles to be generally the same. This equivalence, however, hides broad income shifts that are correlated with changes in family structure and number of earners.

The analysis then proceeds to investigate, in our fifth section, the effect of income on child outcomes employing a typical reduced form OLS regression model (Blau, 1999; Mayer, 1997). The results of this analysis demonstrate that the effect of income on children's behavioural and cognitive outcomes is for the most part significant, even after the application of controls. Nevertheless, we find that the effect of income is relatively small, which concurs with much of the previous research. Based on evidence in the research literature that the effect of income may be working through the home environment of the child (Blau, 1999; Jekielek et al., 1998; Schiamberg, 1991), we construct our own home environment index. Our index is only a very preliminary and much pared down proxy of the psychometric scale measure

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[1] The share file is a nationally representative file of respondents to the NLSCY who permitted the use of their responses by Human Resources Development Canada. It represents approximately 95 per cent of respondents to the NLSCY.

used in previous research in America. We observe that income is related to the home environment measure with children from affluent families tending to have slightly better and more stimulating home environments. This suggests that income plays a part in affecting children's outcomes through the home environment.

Following the data analysis our findings are discussed in more detail in section six. This leads to section seven where the policy implications of the study are addressed. In section eight, we conclude by making some recommendations regarding directions for further research in the area of economic security, including income and poverty dynamics, and into how useful it may be to try and obtain a home environment measure. The ninth section contains the appendices and tables of the study. Our tenth and last section contains the references.

2. Literature Review

It is evident from published studies that many families with children face challenges to their economic circumstances in the form of poverty or income fluctuations, job loss and unemployment, as well as changes to the family structure such as divorce or separation (Picot et al. 1999; Duncan et al., 1998 and Duncan et al., 1994). This is particularly the case for many lone parent families, since many are employed in relatively low-wage and part-time work, characteristics which are associated with less security for the job holder (Vanier, 1998, 1994; Schellenberg, 1997). Furthermore, since a high proportion of lone-parent families are poor (Ross et al., 2000), any change in their economic circumstances is likely to affect the children in the family.

Much of the work that has been done in Canada on income and the economic situation of families with children has looked at the flows into and out of poverty, and the events linked to income change. The Economic Council of Canada, for example, found that 3.1 per cent of non-poor children entered low-income between the years 1982 and 1986. If these children were involved in a marital break-up, the proportion jumped to 37.6 per cent. Similarly, the loss of an income earner in one-earner families had a dramatic effect on the likelihood of these children falling into poverty. While marriage and divorce appeared to have a greater impact on moving into or out of poverty, more children lived in families who experienced labour market volatility such as a job loss (Economic Council of Canada, 1992). Similarly, a recent study drawing on the first two years of the Survey of Labour and Income Dynamics (SLID) found that changes in family composition, notably marriage and separation were more strongly associated with a child entering or exiting poverty when compared to labour market changes, but that changing labour market circumstances of parents were a more likely event relative to marriage or divorce and separation (Picot et al., 1999).

On the question of duration of poverty, earlier studies suggest that individuals and families tend to cycle into and out of poverty (Laroche, 1998; Noreau et al., 1997). Mireille Laroche (1998) found that approximately 60 per cent of working age people in low income face high exit rates out of, and low re-entry rates into, poverty. The remaining 40 per cent however, do experience longer spells of poverty, including children living in lone-parent families. A child living with a divorced mother and one other sibling had more than a 50 per cent chance of spending six years or more of their childhood in poverty

(Laroche, 1998). Drolet and Morrisette (1999) using data from SLID found that between 1993 and 1996, 23.4 per cent of children less than 6 years old and 26.4 per cent of children aged 6 to 17 years were likely to experience at least one year in low income. The likelihood that a child would experience an extended period of poverty was considerably lower. The probability that a child aged 6 to 17 years would experience 4 consecutive years of poverty was 3.9 per cent, while the corresponding probability for children less than 6 years was 6.5 per cent. It is prudent to remember however, that a period of 4 years of low income for a child under the age of 6 represents practically the whole of their early life. Another study using SLID (Picot et al., 1999) found that there was a 25 per cent turnover in the low-income population between 1993 and 1994. Thus, a low-income situation for children and families may be something which is temporary, but that for some it can be much more long term. It should also be remembered that significant changes in family composition and labour market events did have a strong impact on family income over the period of the early to mid 1990s (Picot et al., 1999; Noreau et al., 1997).

What the literature discussed so far did not specifically address is the connection between poverty and the consequences for child development. There is research from American studies to suggest that deep and persistent poverty has a significant effect on short-term and long-term developmental outcomes among American children (Korenman et al., 1995; Chase-Lansdale et al., 1997; Duncan and Brooks-Gunn, 1997; Duncan et al., 1994). Yet, while experiencing extended poverty may affect children's development it is still unclear whether this can be said about the whole of the income spectrum and its effect on children's development (Duncan et al., 1998). As well, the effect of low income on children's development is strongest when observing long periods of poverty and younger children, but weaker for short period or older children.

We turn now to the research literature which specifically relates how income and shifts in the economic circumstances of the family can affect the outcomes of their children. We have divided our review of this material into three broad thematic areas. The first section will deal with issues of income security and child outcomes. In the second section we will focus on family structure changes and how this affects income and the economic conditions of the family and child outcomes. Lastly we study the effect of labour market changes on the economic circumstances of the family and child outcomes.

2.1 Family Income, Economic Circumstances and Child Outcomes

The effect of income on children's development is the subject of some debate. The debate can be divided into two general groups: the " investment" perspective and the " good-parent" theory (Mayer, 1997; see also Haveman and Wolfe, 1995; Haveman and Wolfe, 1994) other researchers prefer the less provocative and slightly more precise terms "consumption expenditures" and "socialization processes." Mayer (1997), in an influential research study, sets out the basic explanations and describes the mechanisms by which these two approaches assert that income affects children's outcomes.

The consumption expenditure perspective, relied upon mostly by economists, contends that parents invest money and time in raising their children. Families with more income can invest in better schooling, neighbourhoods, knowledge and skill training (such as books and computers) than families without access to these resources. Therefore, income provides higher income parents with an opportunity that lower income families do not have. As a result, the children of higher income parents are more likely to succeed, all else being equal, and reap the rewards of these investments.

The socialization processes perspective incorporates two broad social-psychological approaches to explaining the effect of income on children's development: the " parental stress" theory and the " role model theory" . The " parental stress" view argues that the stress of being poor and at the bottom of the income distribution diminishes the capacity of parents to provide effective and appropriate parenting. As a result of being raised in this environment, children of these parents are not able to cope themselves and find that there are limits to their educational and social opportunities. Therefore, as a family's parent's income and economic circumstances improve there is a concomitant decrease in stress and an increase in their ability to provide for their children and family.

The "role model" perspective states that income affects the development of children as a result of the family's social positioning at the bottom of the social hierarchy. This leads low income parents to develop values, norms and behaviours that cause them to be "bad" role models for their children. This form of reasoning has led to a "culture of poverty" argument to explain how these values and behaviours will not change even in response to income transfers. Yet, as Mayer maintains, there are many dimensions along which low-income parents and higher income parents differ, apart from simply

income. It is therefore erroneous to believe that it is solely due to low parental income that children's outcomes differ. Other aspects along which children's parents differ include health, education and whether they marry. It is these parental and background variables which we need to control if we are to try and isolate the unique effect of income on children's outcomes.

A similar perspective forms the basis of Blau's (1999) study. Blau uses a reduced form regression analysis to study the effect of income on children's cognitive and behavioural outcomes with NLSY data.[2] Income, Blau finds, has only a modest effect on children's behavioural problems and less effect on children's cognitive outcomes (PPVT, PIAT reading, and PIAT math). Current income effects are found to be smaller than "permanent" income, which is simply an averaging of income over a number of years. Yet the permanent income effects are also considered to be small relative to the size of income transfers necessary to have a substantial effect on children's development (Blau, 1999: 271). Permanent income is found to be more strongly related to the environment of the child's home (as measured by the HOME scale) than to children's developmental outcomes. The relationship between the HOME scale and children's developmental outcomes is though, relatively modest. Blau concludes that direct income transfers are not feasible as policy tools for affecting child development because the evidence shows the effect of income on child outcomes to be too small.

Mayer (1997) agrees with Blau that the effect of income on child development is small. Using a variety of methods Mayer investigates the effect of both observed and unobserved characteristics on income and children's outcomes including PPVT, PIAT math, PIAT reading, Behaviour Problems Index (BPI), high-school completion and teen pregnancy. Mayer concludes that the " true' effect of income is less than has been traditionally estimated using reduced form analyses. However, while the effect of income on any one child outcome is small, Mayer contends that this effect may be cumulative across many outcomes. As a result this cumulative effect may in the end be quite substantial. While Mayer does not believe that vast new investments in income transfer programs are a solution, she is certainly not arguing for cuts or changes to the existing income transfer policies, since that would almost certainly lead to added problems.

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[2] The NLSY is a national American longitudinal survey which follows a sample cohort of individuals that were aged 14 to 21 in 1979. Data are collected from females and their children from this cohort including information of the cognitive, social, emotional, and physical development of the children.

Data from Duncan et al. (1998) and Duncan and Brooks-Gunn (1997) suggests that more effort should be directed toward improving the economic conditions of early childhood given its large impact on children's later development. Duncan et al. (1998) find that family income is more strongly related to achievement and ability-related outcomes than with health and behaviour measures in children. Income poverty is strongly associated with low levels of pre-school ability. This supports their other findings that economic conditions in early childhood appear to be an extremely important period for later child development. They argue that this evidence supports the raising of incomes for very poor families to aid in the overall development of poor children.

These studies, among others, highlight the detrimental impact of economic disadvantage, but also suggest that the relationship between low-income and child outcomes is complex. As with Blau (1999), other researchers have found that the home environment is a very important variable when assessing the relationship between income and child developmental outcomes (Jeknlek et al., 1998; Smith et al., 1997). The environment of children's homes is measured in America with the Home Observation of Measurement of the Environment (HOME) inventory. When introduced into the analysis of income and a child outcome, HOME acts to reduce the strength of the relationship, but income still remains a significant factor affecting children's development (Smith et al., 1997). The HOME variable, therefore, can be an important factor affecting the income-child outcome relationship. Other factors such as level of maternal education and receipt of welfare income which are highly correlated with low-income status have also been associated with poor child outcomes (Lefebvre and Merrigan, 1998). These results should not be interpreted as meaning that level of income is unimportant, but rather that the particular effect of income can be difficult to disentangle from the other child, family or community variables.

2.2 Family Structure Change, Economic Circumstances and Child Outcomes

Changes in the structure of a family, through either divorce, separation or re-marriage, can have a quick and profound effect on the economic circumstances of children's families (Picot et al., 1999). In their study of family compositional change and low-income children, Picot et al. (1999) find that divorce or separation of low-income families with children exposes these children to very high risks of entering poverty. On the other hand, remarriage has the effect of dramatically reducing the risk of a child being

poor. What are the consequences of these changes for the well-being of the children involved and their economic security?

Recent research has investigated the effect that family structure has upon the well-being of children (Clarke et al., 1998; McLanahan, 1997; Menaghan et al., 1997; Thomson, 1994). A number of different family structures are considered in this research, including the effect of being in a lone-parent family with either biological parent, and living in a step-family with one of the biological parents and their partner spouse. Comparisons are usually made to children in intact family situations. Cognitive, behavioural and academic achievement oriented variables serve as the developmental outcomes measured. In general, changes in the structure of the family are connected with behaviour problems, particularly for young boys, including such problems as impulsive hyperactive behaviour and school behaviour troubles (Morrison et al., 1994; Thompson, 1994; Peterson and Zil, 1986). Boys are also likely to suffer academically as a result of the changes to the family (Morrison et al., 1994). Girls seem less affected by the changes to family composition, although girls experience problems when a parent remarries (Peterson and Zil, 1986). Peterson and Zil speculate that the lack of measurable behaviour problems in girls may simply be due to the fact that the effects are not as easily observed in the girls as in the boys. McLanahan (1997) finds, however, that for both boys and girls, simply growing up with a divorced or never-married mother reduces children's overall behavioural and educational well-being.

A major methodological concern in this research is trying to separate out the direct effect of the family compositional change from any pre-existing marital problems or conflict. Morrison et al. (1994) find that family conflict prior to a disruption of the family is not as important a factor affecting the well-being of children aged 5 to 11. Instead they find that it is the effect of the marital disruption itself which influences the behaviour, math and work recognition scores of boys. However, in an earlier study Morrison and Cherlin (1992) found that the while there were indeed effects on children as a result of these disruptions they tended to dissipate after approximately two years.

What effect do economic resources such as income level, in combination with changes to the structure of the family, have on children? Morrison and Cherlin (1992) find that declines in the economic circumstances of children following divorce are linked to behaviour problems rather than lower achievement. Thomson (1994) finds that economic resources are more important for children in female-

headed lone-parent families, but that these resources are not as important for other family structures such as two-parent and step-parent situations. This view is somewhat confirmed by Clarke et al. (1998) who finds that parental resources do offset changes to family structure. Nevertheless, Thomson (1994) concludes that female-headed lone-parent situations are more likely to transmit economic inequality to their children, while stepfather mother families tend to transmit emotional inequality to their children. However, McLanahan (1997) in an overview of recent research concludes that income tends to be more important than parental disruption for achievement problems, while parental absence is more important with regard to behavioural problems than income.

As mentioned, changes to the structure of the family can have immediate consequences for the economic conditions in which children live. Also, changes in family composition tend to have deleterious effects on the behaviour of children – particularly boys. The role of family disruption in affecting children's academic achievement is somewhat mixed. Economic resources though are observed to have a much stronger effect on children's achievement outcomes compared to family disruption. Overall, changes to the structure of the family can have profound effects on the economic resources of the family and is undeniably an important factor affecting the well-being of children.

2.3 Labour Market Changes, Employment and Child Outcomes

One of the most profound trends in the Canadian labour market since the 1960s has been the growth in female participation rates. While there is research to suggest why this has occurred, for the purposes of this paper what we are interested in examining are the possible effects that an increase in women's paid work may have on their children's development. Does increased paid employment by mothers as well as shifting employment patterns and labour market changes, affect children's development?

A sizeable amount of recent research has concentrated on the effect that increasing employment by mothers has had on their children's outcomes (Harvey, 1999; Greenstein, 1995; Parcel and Menaghan, 1994; Vandell and Ramanan, 1992; Bayder and Brooks-Gunn, 1991; Belsky and Eggebeen, 1991; Desai et al., 1989). The results of these studies have tended to be somewhat conflicting, even when based on the same data from the National Longitudinal Survey of Youth (NLSY) in America. A number of studies address the timing of maternal employment after the birth of a child and possible

consequences for the child's development. Vandell and Ramanan (1992), Parcel and Menaghan (1994), and Greenstein (1995) all find that early maternal employment has no adverse effect on children's PPVT-R scores or behaviour problems. Yet, Desai et al. (1989) discover that early maternal employment is associated with negative effects on the PPVT-R scores of boys from high-income families, and Bayder and Brooks-Gunn (1991) observe that it has negative effects on PPVT-R scores and causes behaviour problems for children from white families only. As well, Vandell and Ramanan (1992) find that it has some positive effects on children's PIAT scores. Lastly, Belsky and Eggebeen (1991) conclude that early maternal employment has adverse effects on their variable ADJUST, a composite of BPI scores and temperament variables. Yet, when they examine BPI scores alone, they do not find significant effects. Blau and Grossberg (1992) conclude that the impact of maternal labour supply on children's cognitive development is sensitive to the period during which the mother works. A woman who works 100 per cent of the weeks during her child's first year of life is expected to lower the child's standardized cognitive development score by about 5.8 points, while a woman who works 100 per cent of the weeks throughout the second and later years is expected to raise her child's score by about 4.2 points.

Harvey (1999) endeavours to reconcile these conflicting results and bring some clarity to the issue of early maternal employment. Some of the contradictory results are due, Harvey argues, to methodological considerations. These include differing definitions of mothers' employment, controlling for different mediating variables, and not taking into account the fact that early NLSY data are based on non-representative samples. Using recent data from the NLSY, Harvey's (1999) analysis examines five child outcome variables: compliance (assessed using a six-item sub-scale from the Temperament scale), behaviour problems (assessed using the BPI), cognitive development (PPVT-R score), self-esteem (measured using the self-worth sub-scale of the self-perception profile for children), and academic achievement (PIAT sub-tests for math, reading recognition and comprehension). Correlations among the early parental employment variables and child outcome variables suggest that, before controlling for selection factors, mothers' working early in the child's life is generally associated with more positive child outcome. However, more intense maternal employment (working more hours) is associated with less positive child outcome.

The results of Harvey's research reveal few simple effects of early parental employment. There are no significant main effects of early maternal employment status. Among mothers who were employed during the first 3 years of a child's life, the only significant effects were found for those mothers regarding the timing of their return to employment and whether they experienced and breaks in employment during this three year period. Returning to work later and greater continuity of employment in the three year period by the mothers were associated with somewhat higher compliance in 3 to 4 year-olds, although these effects were small. Among mothers who were employed during the first 3 years, working more hours was associated with significantly lower PPVT-R score through age 12. However, again the effect was small – an increase of 10 hours per week was associated with just a 1 to 1.5 point decrease. Working more hours was also associated with significantly lower achievement scores in 5 to 6 year-olds, but the effect was also small – a 10 hour increase was associated with a 0.6 point decrease in PIAT score, but this effect was not maintained beyond age 6.

Harvey finds no evidence that race or job satisfaction moderate the effects of early maternal employment. As well, no consistent evidence is found that income and gender act as moderators. Modest support is found for the moderating effects of marital status on early maternal employment. It appears that for single mothers, being employed during their child's first 3 years is associated with significant and slightly higher PPVT-R scores. Income is found to moderate some of the effects of maternal employment during the first year for children but does not do so on boys' PPVT-R scores. As well, the number of hours worked by employed mothers and discontinuous employment during the first year, are not associated with children's level of compliance.

Harvey's results do though, provide partial support for the hypothesis that early parental employment has a positive effect on children's development by increasing family income. This positive pathway seems to affect children's behaviour problems and academic achievement but not compliance, self-esteem or language-cognitive development. All of these indirect effects exist largely in the absence of any total effects of early parental employment on behaviour problems and academic achievement, suggesting that early parental employment may have both positive and negative effects on children's development that counteract each other. Although data regarding the quality of child care were not available, Harvey argues that previous research indicates that it is an important contextual variable

Although maternal employment appears to have little effect on these children's development, quality of early child care may have a much larger impact.

The generalizability of research findings on the effect of mother's employment is important to ascertain since they are all based upon American data. Recent Canadian research using data from the NLSCY finds results that are not too dissimilar (Lefebvre and Merrigan, 1998). Parental employment and maternal non-employment are not found by Lefebvre and Merrigan (1998) to be associated with children's cognitive development (using the PPVT for 4 and 5 year-olds). Maternal full-time work does directly affect the probability of negative behaviour outcomes for children aged 4 to 11 years, but the effect is small relative to the that of other variables such as receipt of welfare, female family head or step-family characteristics.

Other researchers have studied the effect of the general context of economic security and labour market circumstances on children's development (Conger et al., 1997; Cooksey et al., 1997; Menaghan et al., 1997). Menaghan et al. (1997) study the relationship between work and family patterns and the behavioural well-being of children in middle childhood, while Cooksey et al (1997) utilize a life-course perspective to investigate three aspects of the employment conditions of parents: employment status, work stability and occupational complexity. In this case, employment status simply measures whether a parent was employed or not, work stability is measured as the number of hours usually worked per week, and occupational complexity is a measure of the content of the work including aptitude, direction, control and planning. Cooksey et al. find that the relationship between work patterns and children's behaviour is not uncomplicated. Children whose parents have greater work stability and more complex occupational tasks generally have fewer behavioural problems. Menaghan et al. find though, that the effect on children's behavioural development of intermittent parental employment over a five year period is no better than having had no employment over this same period. As well, Cooksey et al. observe that maternal resources, such as level of education, cognitive level, self-esteem and age, are important for behavioural development in children. These resources not only shape and influence the work conditions in a family, but also have significant direct effects on children's behavioural problems.

The economic circumstances of the family also affect the cognitive development of children. Using a sample of rural American adolescents Conger et al. (1997) find that family economic problems

adversely affect the academic performance of teenagers. Even when background characteristics such as parental education are controlled, Conger et al. detect a direct relationship between economic pressure and the grade point average of these adolescents. Economic pressure is conceived in terms of the family's difficulty in paying bills, whether money was left over at the end of the month, whether income met the family's expenses, a material needs measure, and an indicator of financial cutbacks (1997: 304). Important factors associated with economic pressures for lower income families are changes in the labour market, such as unemployment, which lead to losses of income (Picot et al., 1999; Bane and Ellwood, 1985).

Thus, a number of studies find a relationship between labour market variables, a family's economic circumstances and children's outcomes. In general mothers' employment is associated with a greater likelihood of children experiencing behavioural problems and some researchers find a relationship with cognitive measures such as the PPVT. These relationships, however, are on the whole not found to be strong. As well, the pattern, stability and complexity of parental employment is associated with changes to the behavioural and cognitive development of children. Children in families under economic pressure find that they face additional problems of lower academic scores. A family's economic welfare, in the form of labour market changes, can affect children's development in a number of ways.

3. Methodological Considerations and Hypotheses

3.1 Sample Information and Descriptive Data Selection

The data used in this study are obtained from the share file of the NLSCY which is a nationally representative sample of children collected in 1994-95 and 1996-97. The unit of analysis in the survey is the child. All information and analyses, therefore, must be interpreted from the standpoint of the child rather than that of the family or parent. The total sample of children surveyed in 1996-97 was 20,025, ranging in age from 0 to 13 years. Our analysis in this paper focuses on the share file cohort of children aged from 2 to 13 years old in 1996 (ages 0 to 11 in 1994), yielding a sample of 15,266 children. Our reason for choosing this sample was to represent as wide an age range as possible and also thereby obtain a broad number of developmental outcomes to investigate. Children one year or younger were excluded because information for them was not available for both cycles. As in other research using the NLSCY (Lefebvre and Merrigan, 1998) we decided to concentrate our analysis on children in two parent and lone mother parent situations, and where the person most knowledgeable (PMK) was either the mother or father (including biological, adoptive and step).

The analyses use longitudinal and cross-sectional weights where appropriate to obtain the results and estimates, which were provided on the NLSCY database. Statistics Canada release guidelines for data quality have been followed for this analysis. Where any tests of significance were necessary we constructed a new "sample" weighting variable for the sample population of children ages 2 to 13 years in 1996. This new sample weighting variable was constructed by dividing each respondent's existing longitudinal weight by the mean of the overall longitudinal weights. The new sample weight has a mean of one, but avoids overestimations for tests of significance while maintaining the relative positioning or distribution of the original variables being tested.

For the descriptive data analysis we constructed a number of income, family structure and wage earner change variables, as well as recoding the child outcomes. Income change is measured in two ways: using the proportional change in household income from 1994 to 1996, and using a derived variable of whether children's household income changed relative to Statistics Canada's low-income cut-off (LICO) from 1994 to 1996. Family structure change is measured as a derived variable that observed

whether children were in the same family type (lone-parent or two-parent) in 1996 compared to 1994. Wage earner change is calculated as the change in the number of parents participating in the paid labour market from 1994 to 1996.

Our child outcome variables were recoded in two different ways. For the Peabody Picture Vocabulary Test (PPVT) and Motor and Social Development (MSD) standardized scales we used pre-existing cut-offs to differentiate delayed, normal and advanced development. We then calculated whether children had stayed or moved from one category to the other from 1994 to 1996. For example, if they moved from advanced to normal or delayed development on one of the scales, then they were considered to have a worse score in 1996 than in 1994. For the behavioural variables we used a technique that Offord and Lipman (1996) developed. This technique views the top 10 per cent of the distribution on a scale (such as the property offences scale, for example) as exhibiting the behaviour being studied. Applying the 1994 scale score as the cut-off for 1996, we then established whether children were still in the same category in 1996 as in 1994. If they were, then they had not changed. A child who went from the top 10 per cent in 1994 to below the top 10 per cent in 1996 were viewed as improving, and vice versa meant the child's behaviour scored had worsened.

3.2 Regression Model Data Selection

The most common manner in which the effect of income security on children's outcomes is studied, uses a reduced form OLS regression analysis (Blau, 1999; Duncan et al., 1998; Mayer, 1997). As Mayer (1997) explains, the reduced form model does not try to identify all of the possible mechanisms through which family income affects children's outcomes. Instead, this strategy wants to observe what the direct effect would be of an increase in family income on children's outcomes. For example, how much of an effect would an increase of $10,000 have on a particular child outcome. Conventionally a reduced form regression model controls for those characteristics that affect the relationship between household income and children's outcomes, but which are causally prior to the income variable. This is not quite as straight forward as it may seem.

The causal relationship between income and the independent control variables is important to bear in mind when selecting variables for inclusion in the analysis. We do not want to include in our analysis any

variables which may be a result of income, except for children's developmental outcomes. By controlling the effect of these variables in our regression we effectively reduce the impact that income will have on the child outcomes. Mayer (1997) for example, argues that the inclusion of a marital status control reduces the effect of income on children's outcomes. Marital status is in part a result of income (low-income men and women are less likely to marry when they have a child than men and women with higher incomes, and when low-income men and women do marry they are more likely to separate or divorce), but it is also the case that marital status causes income (lone-parent families are relatively poorer due to have only one earner). There is no way to estimate just how large the underestimation of the income effect would be in this case. Mayer (1997) admits that excluding marital status variables leads to income effects that are over estimated. However, other studies do include marital status including Duncan et al. (1998), to account for the effect that reduced incomes can have on children in these families. As we discuss below, our study relies on previous research to select the control variables, although in some cases their inclusion may be debatable.

Once we have controlled for the effect of background characteristics then the direct effect of income on child outcomes can be observed and discussed. Unfortunately we are unable to replicate the study by Mayer (1997) to obtain the " true" effect of income, or the study by Duncan et al. (1998) investigating the effect of siblings, because the NLSCY database does not contain the appropriate variables. We will instead rely on the reduced form OLS regression approach to estimate the effect of income on our dependent child outcomes.

3.3 Regression Variable Description and Construction

3.3.1 Child Outcomes: Dependent Variables

For our analysis we wish to use a wide variety of outcome measures. The literature review demonstrates that the effect of income depends on the outcome variable used and the age of the child. We use two cognitive development measures from the 1996 NLSCY, Motor and Social Development (MSD) and the Peabody Picture Vocabulary Test (PPVT), which cover children in the age ranges from 2 to 3, and 4 to 7 years respectively. As well, we investigate the influence of income on six behavioural scales measuring children's hyperactivity-inattention, prosocial behaviour, emotional disorder-anxiety, aggression, indirect aggression and property offences, for children aged 4 to 11 years in 1996. We

chose the behaviour scales as dependent variables because American research has shown the Behaviour Problems Index (BPI) in the NLSY to be related to income (Mayer, 1997; Hanson et al., 1997). Lastly, we observe the effect of income on two academic measures – Reading and Math – for children aged 10 to 13 years in 1996. Following Blau (1999) we divide each of our dependent variables by its standard deviation. This will allow us to express any changes in our regression coefficients in terms of standard deviation units for each dependent variable.

3.3.2 Home Environment Dependent Variable

The importance of the home environment for children's development is recognized by social researchers (Blau, 1999; Lefebvre and Merrigan, 1998; Duncan and Brooks-Gunn, 1997; Hanson et al., 1997). This importance is reflected in the fact that data gathered for the NLSY in America allows for the construction of the Home Observation for Measurement of the Environment (HOME) scale composed of cognitive, social and physical environment variables (Jekielek et al., 1998). This index, or a shortened version of it, has been used in a number of American studies that investigate the effect of economic security and child outcomes (Blau, 1999; Jekielek et al., 1998; Smith et al., 1997). Evidence from these studies suggests that the HOME scale is associated, although somewhat modestly, with children's developmental outcomes. As well, Blau (1999) demonstrates that family income is quite strongly related with the HOME variable. Given the evidence from other studies pointing to the connection between income and the HOME scale, as well as between the HOME scale and children's developmental outcomes, we have chosen to try and capture the extent of the children's home environment for our sample of children by constructing our own index variable to serve as a substitute for the HOME environment variable.

In a recent Canadian study, Lefebvre and Merrigan (1998) used the extent of literacy activity in children's homes as a measure of the cognitive environment. While this recognizes the importance of the home environment for children, it doesn't capture enough of the facets included in the HOME scale. Our proxy home environment variable will include literacy activity as well as some other variables that approximate the variables used in the HOME scale to capture the social and physical environment of children's homes. Since many of our child well-being measures, as well as many of the possible

variables to measure the home environment, differ by children's age, we have constructed four separate home environment proxies – reflecting the age groups of the children to which they apply.

The HOME scale was developed by Caldwell and Bradley as a 45 minute inventory designed to assess particular characteristics of young children's environment (Desai et al., 1990). The HOME measure is obtained by means of a self-report section by the child's mother and an interviewer evaluation. Two major subscales compose the measure, the cognitive stimulation available to the child and the emotional support provided by the mother (Desai et al., 1990). The original scale is considered to be a very reliable measure but most of the recent research has used smaller sub-scales of the original, including Blau (1999), Jekielek et al. (1998) and Desai et al. (1990).

The construction of our proxy variables attempts to reconstruct the HOME scale using the item list from Blau (1999), Jekielek et al. (1998) and Desai et al. (1990). A problem with this is that the NLSCY does not contain assessment data from the interviewer in cycle 2. Our proxy variables, therefore, will rely solely on information provided by the PMK. Variables from the NLSCY are chosen which we feel are close in content and meaning to those items listed in the studies mentioned. As described in Blau (1999), each of the items composing the HOME environment index are dichotomized so that a score of one indicates a better home environment. We have followed this procedure as well. Our proxy variables are obtained from the dichtomous components by simply summing across the various components. The final proxy variables have scores ranging from 0 to 4, where a higher score indicates a better home environment.

The first proxy used in our analysis – Home Environment Proxy 1 – measures the home environment for children ages 2 to 3 years and consists of the following four components:

- Whether or not the PMK or others ever read to the child. Those who responded "yes" were assigned a value of 1, while those who responded "no" were assigned a value of 0.

- A second cognitive component focus on "How often does the child play with pencils or markers doing real or pretend writing?". Children who did so "once a week" or less were assigned a 0, those who did it "a few times a week" or more were given a 1.

- We also included a third cognitive component that again focuses on the parent-child interaction and learning, specifically "How often do you help or encourage the child to write or pretend to write?". This approximates the HOME variables regarding whether the parent helps their child to learn the alphabet, numbers, colours and shapes. Those parents who helped their children "once a week" or less were assigned a 0, those who did it "a few times a week" or more were given a 1.

- A family involvement variable is included that addresses the extent to which children are exposed to a lack of emotional support. The original HOME variable uses information over two components regarding physical punishment (such as spanking) and the anger of the child's parents. We have used a parenting question "When " child" breaks rules or does things that they are not supposed to, how often does the parent use physical punishment?". We have coded children whose parents "always", "often", or "sometimes" do this 0, while parents who "rarely", or "never" do this were given a 1. PMK's participation and interaction with the child. This used the question "How often do you and [child] talk or play with each other, focussing attention on each other for five minutes or more, just for fun?". Those who responded "never", "about once a week or less", or "a few times a week" were assigned a value of 0, while those who responded "one or two times a day", or "many times each day" were assigned a value of 1.

Our second home environment proxy (Home Environment Proxy 2), covers children 4 to 7 years of age corresponding to the age range for the Peabody Picture-Vocabulary Test - Revised (PPVT-R). This proxy consists of four components also. We use both the parental help with reading, or reading alone for the older children (7 years), and the parental physical punishment components used in Home Environment Proxy 1 and four additional variables described below:

- A variable addressing the child's television and home video viewing was included. The original HOME scale measured whether the TV was on 4 hours or less per day. Using this cutoff we constructed a variable on children's TV or videos habits at home. Those who watched 4 hours a day or less were assigned a value of 1, while children who watched 5 hours or more per day of TV were assigned a value of 0.

- The fourth component of the Home Environment Proxy 2 variable was regarding children's structured recreational activities. The original HOME scale measured whether children obtained special lessons or had access to a musical instrument. We have used the structured recreational activities to approximate this observing whether children participated in organized sports, took dance, gymnastics or martial arts, took lessons in music, art or was involved in a community activity such as guides, cubs or a church group. Those who participated once a week or more frequently were assigned a value of 1, those who participated less frequently or not at all were assigned a value of 0.

Our third and fourth home environment variables (Home Environment Proxy 3 and Home Environment Proxy 4) are used for children ages 4 to 11 years and 7 to 11 years, corresponding to the age ranges for the six behavioural outcomes and the reading math scores, respectively. The same four components that were used in the Home Environment Proxy 2 are included in the last two proxies. The differences between the three are with regard to the relevant age related questions used to generate the proxy. For example, the structured recreational activity questions used in the Home Environment Proxy 2 were answered by the parents and refer to children aged 4 to 9 years. Older children self-respond to similarly worded questions regarding their participation in various structured recreational activities, their TV watching, and their reading habits. The parental question regarding physical punishment is answered by the parents for children of all ages.

Given the lack of interviewer information and low correspondence between the NLSCY questions and those found in the original HOME scale, our four components for composing each proxy variable is somewhat less than the 11 to 13 components in the HOME sub-scales used by Blau (1999), Jekielek et al. (1998) and Desai et al. (1990). The distribution and coverage of our four proxy variables are therefore limited compared to the original HOME scale (Table 1 - see Appendix for all Tables). Nevertheless, they provide us with some measure of the extent to which the home environment is affected by income. A reliability test of the four home environment proxies demonstrates the limits of these variables, providing low to very low Cronbach's alpha scores (Table 2). However, a correlation performed with two of the income variables we have constructed and each of our four home environment proxies shows that the proxies are definitely correlated with income, although we observe these are range from very low to low/moderate correlations (Table 2).

3.3.3 Independent Variables

Income Variables

The exact choice of which variables to include in our model is not straightforward. A variety of income measures have been used in past research including current income, permanent income, logarithmic income, categorised income, income-to-needs ratio, and poverty. Current income has been shown by Mayer (1997) and Blau (1999) to be a less than adequate measure of a family's income over time. Fluctuations in income associated with specific time periods are considered to be transitory in nature and not to have much influence on children's development because families maintain their consumption patterns by borrowing against future earnings (Mayer, 1997: 63). Therefore a more accurate representation of income is to use an average of the family's income over a set time period, that is "permanent" income. Since we only have two cycles we will use an average of the household income using information from the 1994 and 1996 NLSCY. Again following Blau (1999), we express our "permanent" income measure in units of $10,000. As well, we calculate a logarithmic "permanent" income measure to adjust for income's skewed distribution, which is expressed in natural log units.

We also adopt a categorical income variable, following from Duncan et al. (1998). This allows us to observe the effect of income transitions across discrete income breaks. We do not include an income-to-needs measure in our analysis because Bane and Ellwood (1985) argue against the use of income-to-needs ratios. They contend that while we may talk about "permanent" and "transitory" components of family earnings it is not clear that this same logic can be applied to the income-to-needs concept. As well, using an income-to-needs ratio would not allow us to estimate the separate effects of income and needs, such as family size. Lastly, we decided to include in our model a dichotomous poverty variable, derived from the 1996 LICO variable in the NSLCY database. It is coded 0 for non-poor and 1 for poor families. This will provide important information about the effect that movement out of poverty may have on children's developmental outcomes.

Other Control Variables

Mayer (1997) argues for a very limited number of control variables: age and race of the child, household size, mother's age at child's birth, mother's measured intelligence, and mother's education. Blau (1999) on the other hand excludes variables such as parental labour supply, household structure and parental education, since these are potentially jointly chosen variables with income. That is, income may influence your choice of whether and when to have children, or get more education or enter the labour market. Blau does control for other variables such as gender of the child, ethnicity race, age of child, mother's

education (present date), number of siblings (older and younger), marital status of the mother, mother's age and measured intelligence, and variables relating to the child's grandparents and geographic location where mother was raised. Duncan et al. (1998) use household structure and labour participation as control variables as well as the race and gender of the child, the total number of siblings of the child, mothers age at child's birth, mother's years of schooling, residential mobility and where the mother was raised.

Since many of the geographic and extended family variables used in these other studies are not available on the NSLCY we cannot use them in our research. Instead of using race or ethnicity in our study we will use, as do Lefebvre and Merrigan (1998), a variable indicating whether the mother of the child was an immigrant to Canada. We use this variable as a dichotomous variable (yes or no, mother was an immigrant) while Lefebvre and Merrigan categorise the time since immigration. We include family structural variables as controls in keeping with Duncan et al. (1998) and because of the research literature showing the connection. The family structure variables consist of a dichotomous variable representing lone-parent family membership in 1996, and a longitudinal variable measuring the change in family structure from 1994 to 1996 (whether the family structure stayed the same, either two parent or lone parent, or changed from a two parent to lone parent, or vice versa.

Following the lead of Blau (1999) and Duncan et al. (1998), we include family variables such as the size of the family, the gender of the child, and the number of siblings, in our analysis. As well, characteristics of the mother are integrated into the analysis, including mother's age at birth of child, mother's education, and mother's employment. We also integrate a geographic variable to control for background characteristics of urban versus rural dwellers. We divided the urban dwellers between large urban centres (100,000 people or more), small urban centres (less than 100,000 people) and then rural dwellers.

3.4 Hypotheses

The main hypothesis to be tested in this study is that a family's economic circumstances – as measured by income level and income change – will affect child outcomes. We expect that children from families with lower income security are more likely to have negative behavioural outcome scores and lower cognitive development scores (as measured in the NLSCY). However, children from families with higher income security are more likely to have positive behavioural outcome scores and higher cognitive development scores. We also believe that changes in familial circumstances such as divorce and separation, as well as labour market changes such as a decrease in the number of earners in a family, will have a negative impact on the income security of children's families.

4. General Findings and Cross-Tabulations

4.1 Income, Poverty, Family Structure and Number of Earners – Changes from 1994 to 1996

One of the questions we wanted to address in this research is the degree of income fluctuation affecting Canadian children's families. Looking over the cross-sectional distributions of household income in the margins of Table 3 shows that there have been some small, but relatively minor changes in the overall distribution of household income over the period from 1994 to 1996 for most of the children's (ages 2 to 13 years) families. However, as mentioned in our literature review and methodological section, "permanent" income is considered a more stable measure of a family's household income as compared to any single year's income. The deceptiveness of relying upon cross-sectional estimates is borne out if we observe the large degree of fluctuation in household income from 1994 to 1996 within the body of Table 3. Less than 60 per cent of children in households with incomes below $19,999 in 1994 were still in this income category by 1996.[5] A larger proportion (82.9 per cent) of upper income households ($50,000 or greater) in 1994 were still in this category in 1996. Of children's families with household incomes in the other income categories, only approximately one-third stayed in their 1994 income category.

While shifts in absolute dollar amounts can be informative they do not capture the proportional changes in household income. Observing the amount of proportional change in household income between 1994 and 1996 controls for differing income sizes. That is, a change of $10,000 is of much greater consequence proportionately for a household earning $40,000 per year as compared to one earning $100,000. If we observe the results in Table 4 we see that many children's families experienced fluctuations, both increases and decreases, as high as 25 per cent or more. Approximately 17 per cent of children's families had by 1996 seen their 1994 household income cut by one-quarter. On the other hand over 23 per cent of children had experienced an increase in their family's household income of over one-quarter of the 1994 family income. Overall, only approximately 18 per cent of all children's families had maintained a relatively steady household income (a loss or gain of less than 5 per cent from

[5] All 1994 income figures control for the effect of inflation. Thus, all changes represent "real" income changes from 1994 to 1996.

1994 to 1996). Over one-third of children's families (36.7 per cent) had experienced a loss of 5 per cent or greater in their household income, from 1994 to 1996. In contrast, approximately two-fifths (44.7 per cent) of all children's families saw their household income rise by 5 per cent or more from 1994 to 1996 in real terms. These results speak to the very volatile situation facing the economic circumstances in which children are raised.

It should be borne in mind that we have not controlled in Tables 3 and 4 for family size. The income fluctuations which we observe in both Table 3 and 4 may very well have different consequences for families of differing size. Indeed, it possible that changes in family income that seem quite large may not even affect the consumption patterns of the affected family if they are able to draw upon savings or assets to offset this loss. Unfortunately, such asset and debt information is not available on the NLSCY.

Income fluctuations can, as we discussed in the previous sections, have a profound effect on children at the lower end of the income scale. Research evidence points to the length of time children spend in lower income and poverty situations as affecting their well-being. Our analysis shows, as with the general household income information, that cross-sectional poverty information remains relatively stable from 1994 to 1996 (23.7 per cent and 24.2 per cent, respectively) (Table 5). However, this seeming relative stability masks large fluctuations. Almost 7 per cent of children moved out of poverty between 1994 and 1996. Over the same time period a slightly larger proportion (7.4 per cent) of children moved into poverty. More disturbing is that almost 17 per cent of children who were poor in 1994 remained poor in 1996. Over two-thirds (68.9 per cent) of children were non-poor in both 1994 and 1996. Our results show that a large proportion of children, over 30 per cent, experience poverty at one time, with over half of these children remaining poor over the period of investigation. These findings are comparable to those found by Drolet and Morissette (1999) using SLID data. They found that 14.9 per cent of 6 to 17 year olds, and 18.0 per cent of children less than 6 years, had experienced at least 2 years of low income, over the period from 1993 to 1996 (Drolet and Morissette, 1999).

Changes in income, particularly as they relate to poverty, are connected to many factors but labour market and familial changes are among the two most important, as Picot et al. (1999) demonstrate. Information in Table 6 measures the relationship between changes in family structure and changes in poverty status. A relatively small proportion of children experienced changes in family status from 1994

to 1996 approximately 7 per cent (Table 6). Of those children who underwent a change from a two-parent to lone-parent family, almost 28 per cent also moved into poverty. This proportion was more than three-times the proportions of children who moved into poverty yet did not experience this family structural change. Of those children who underwent a change from a lone-parent family to a two-parent family, over 30 per cent (30.7 per cent) moved out of poverty. Again, this shift was approximately 3 times greater than that experienced by children who had stayed in lone-parent families and two-parent families over the period from 1994 to 1996. Shifts in family income would seem to be strongly associated with changes in family structure, corroborating the findings of Picot et al. (1999).

As a measure of labour market changes we observed the effect of changes in the number of earners in children's families (Table 7). Over the period 1994 to 1996 approximately 70 per cent of children's families experienced no change in the number of earners. During this same period, over eight per cent of children's families suffered a decrease in the number of earners, and almost 22 per cent of children's families witnessed an increase in the number of earners. We observe in Table 7, that the propensity to fall into poverty or to escape it, is directly correlate with changes in the number of earners. The proportion of children whose families moved into poverty and experienced a decrease in the number of earners is 18.5 per cent. This figure is approximately three times the proportion of children whose families had no change (6.0 per cent) and well over twice the proportion of children whose families had an increase in the number of earners (6.9 per cent). On the other hand, children whose families underwent an increase in the number of earners are almost twice as likely to move out of poverty (11.9 per cent) as those children whose families experienced no change or a decrease (4.9 and 6.6 per cent, respectively). As with family structure changes, changes in the number of earners in children's families is seen to be related with a likelihood to move into or out of poverty.[4]

4.2 Income Changes and Child Outcomes

We have observed that for many children the economic situation of their family is extremely volatile from one period in time to another. Additionally, these changes are seen to be correlated with family structure and labour market variables. What we now need to understand is whether these fluctuations in the

[4] We must acknowledge that data in Tables 6 and 7 are not necessarily unconnected. For example, the number of earners in families can be affected by structural change in the family's composition. A lone parent who is in the paid labour force and subsequently marries another person who is also in the paid labour force is effectively doubling the number of earners in the family.

family's economic security, as measured by proportional changes in household income, might also be associated with the well-being of the children in these families.

In order to determine the extent to which changes in family income may be correlated with changes to the well-being of children, we compare the effect of proportional changes in household income over the period from 1994 to 1996 to changes in a number of child outcomes (Table 8a to Table 8h). The outcome measures we use include the MSD, PPVT and six behavioural outcomes. As discussed in the methodology section, we observed the extent to which children were likely to maintain, improve, or worsen their scores on each outcome, from one time period to the other. If family income is associated with children's outcomes we would expect to observe that decreases in family income are associated with a worsening in children's well-being, while increases in family income are associated with stability or improvements in children's well-being.

Our first table (Table 8a) shows the results for our analysis of income changes and motor and social development. The majority of children (61.3 per cent) who took the test in both years, remained at their existing level of development. This figure is not constant across the change in household income variable. However, there is not a discernible pattern in the table. Large decreases as well as increases in household income are both associated with worsening scores by children from 1994 to 1996. For example, 25.6 per cent of children whose family suffered a decrease of between 15 to 24.9 per cent of their 1994 household income, had a worse MSD score in 1996. Yet, 22 per cent of children whose families experienced an increase between 5 and 14.9 per cent of their 1994 household income also had a worse MSD score in 1996. A similar dynamic is observed for those children who improved their scores. No clear pattern emerges between children's MSD score changes and income changes from 1994 to 1996. This is also seen by the fact that a Tau-b measure of association for the table is extremely weak at 0.004, or no association.

Turning to the PPVT scale (Table 8b) we can see that those children in families which experienced increases of over 25 per cent in their 1994 household income, are not as likely to have worse scores in 1996. Overall, the majority of children (70.3 per cent) maintained their 1994 score level. Yet, as with the MSD scale, there is not a clear pattern connecting income changes to children's outcomes. These changes in household income may have been too recent to have had much of an effect on the children's

cognitive scores, or it may be that children's cognitive development is less affected by these changes than behaviours. Again, our Tau-b measure yields a significant but weak relationship 0.026.

If we observe the effect of our household income change variable on the six behavioural measures (Table 8e to Table 8h) the results tend to be as mixed as those we observed for the MSD and PPVT. Children whose families experienced a decrease in household income from 1994 to 1996 are just as likely to have worse scores on the hyperactivity-inattention, prosocial, conduct disorder-physical aggression, and property offences scale as children whose families did not suffer any loss or had a large increase. The Tau-b measures of association for the hyperactivity-inattention, prosocial and property offences scores and household income were significant but small (-0.030, -0.019, and 0.020 respectively) (Tables 8e, 8d and 8h). The Tau-b measure for conduct disorder-physical aggression is not significant.

Children whose families experienced an increase in their household income are slightly more likely to have had worse emotional disorder-anxiety scores than children from families where there was an income decrease. For example, over twelve per cent of children in families experiencing an increase of between 15 per cent and 24.9 per cent of household income had worse emotional disorder scores in 1996 than in 1994. This compares to just 5.9 per cent of children with worse emotional disorder scores in 1996, whose families experienced a decrease in income of between 15 per cent and 24.9 per cent The relationship between household income and emotional disorder is significant but weak when measured using Tau-b (-0.029).

Observing the results for indirect aggression, children from families that endured a decrease in their household income from 1994 to 1996 are slightly more likely to have improved their scale scores than children in families that did not experience an income loss. This result is not a very strong relationship, differing only by two or three percentage points on certain categories of the income variable. Our Tau-b measure confirms that this relationship is not significant.

It seems to be the case that overall, little relationship exists between the experience of household income increases or decreases and the behaviour exhibited by children. Our results show that children from households where there has been an increase in income are generally just as likely to have

improved worsened scores on these behaviour measures. As with the MSD and PPVT, the time between the income loss gain and any effect on the behaviour outcome may still be too recent to properly ascertain. Nevertheless, one might expect that some indication would be evident in the data.

What our findings regarding income changes and children's outcomes suggests is that the short term income fluctuations we have measured may not have an immediate and simple effect on children's well-being. We have measured these changes only over a two year period. It may be the case that a longer period of observation is needed to observe any relationship. Furthermore, we did not control for a variety of circumstances that we would expect may have attenuated any relationship that exists. For example, it is conceivable that it is not simply the fluctuation itself that affects the children's well-being, but rather the fluctuation in combination with the level of income the family starts with. Even large drops in income may not have the same effect on children at the upper income levels as in the lower income levels. Furthermore, these increases or drops may simply be planned aspects of a families life, such as a parent leaving the labour force to have a baby or stay home to look after the children. In both these cases the drop in household income may be a deliberate process accompanied by a better home environment. On the other hand an increase in household income may be signalling a return to the workforce by a parent, with possible changes to the home environment for the children. We now turn our attention to the task of observing what the effect of income security is on children's outcomes when we control for background characteristics of the parents.

5. Income and Children's Outcomes – Empirical Findings from the Reduced Form Regression Model

Our analysis in this section concentrates on analyzing two different reduced form regression models as well as regressions that investigate the effect of income on the home environment. Model 1 is a simple bivariate regression analysis of each of our four different income concepts by each child outcome. This model will serve as a baseline to study the effect that introducing controls has on the relationship between income and our selected child outcome variables. As well, this first model allows us to obtain a measure of the income effect.

Model 2 applies a number of controls for parental characteristics and other variables that may affect children's outcomes (independent of their effect on income) to the original bivariate regression analysis. This serves to reduce the effect of income on the developmental outcomes of children, but represents a closer approximation of the "true" effect of income.

In the final regression series we investigate whether the home environment, following the method of Blau (1999), can serve to add to our understanding of the relationship between income security and children's developmental outcomes. Blau wants to know whether purchased goods and services contribute to children's development and uses the HOME measure as a summary measure of certain aspects of the quality and quantity of parental inputs. Therefore, Blau argues, the HOME measure provides information on whether input demand is sensitive to income. Blau did find that income, particularly "permanent" income has a moderate effect on the HOME measure. We decided to test this by using the four Home environment proxy variables we created.

5.1 Descriptive Statistics for the Independent Variables and Outcomes

In Table 9 we have provided the simple descriptive data for our independent variables used in our regression analysis. The relevant means and standard deviations of each group of outcomes, are discussed below.

5.1.1 Motor and Social Development

The sample of children for this variable is almost evenly split between boys and girls, with an average of 1.2 siblings. They are most likely living in a large urban area in a two-parent family, and have not

experienced any change in their family's circumstances over the period from 1994 to 1996 (Table 9). Mothers of these children had a mean age of 29 when the child was born and are likely to be working full-time. Most of the children's mothers have completed some post-secondary education or higher, and a relatively large proportion of mothers are immigrants (17 per cent). The mean household income averaged over the period 1994 to 1996, was just over $49,000.

5.1.2 The Peabody Picture Vocabulary Test

Children in this sample have a slightly higher number of siblings (1.3) than we observed with the MSD sample (Table 9). As well, there is a slightly larger proportion of girls than boys. This is likely to due to the fact that the sample is from older children who are more likely to have a number of younger siblings. Like the MSD sample, most of these children lived in large urban areas with over 100,000 people, and they had not experienced a change in family structure over the 1994 to 1996 period. The mean age of the mothers at the birth of the child is slightly higher (29.8 years) than we saw with the MSD sample. The children's mothers were still more likely to be working full-time and have received at least some post-secondary education or higher. As well, the mothers of the children were not likely to be an immigrant, although a relatively large proportion were likely to be immigrants (15.6 per cent). The mean household income over the 1994 to 1996 period was also higher in this instance ($52,000) than we found with the MSD sample.

5.1.3 Behaviour Scales

Since the behaviour scales are composed from the same age group and because the descriptive statistics are so similar, we concentrate in this section on the results for the Hyperactivity-Inattention behaviour scale. A study of the results in Table 9 show that the Hyperactivity-Inattention results are almost identical to those for the other behaviour variables. Nevertheless, we do present all of the data for the other behaviour variables in Table 9, it is just not discussed here.

Children in the sample for Hyperactivity-Inattention tended to have slightly more siblings than in the previous two samples (1.4), again likely due to the older age group observed. As well, the age of the mother at the child's birth is a bit higher, 29.8 years. However, the vast majority of these children did not experience any change in their family structure (94 per cent). As we found with the MSD there are slightly more boys than girls in this sample, but as with the PPVT there is a relatively large proportion of

mothers who immigrated to Canada (16 per cent). These children are still more likely to be living in large urban areas, and to have a mother who has at least some post-secondary education and who is working full-time. The mean household income of almost $54,000, averaged over the two years, is also higher than found in the MSD and PPVT samples.

5.1.4 Math and Reading Scores

Each of these two outcomes uses the same age group sample and have almost identical results. Children in each of these samples has almost 1.5 siblings, a mean age of their mother at the child's birth of 28 years, and are likely to live in large urban areas. There is an even proportion of boys and girls. Approximately 17 per cent of the children's mothers are immigrants, with the majority of mothers having at least some post-secondary education or higher. The vast majority of mothers work full-time. And the children are not likely to have experienced any structural change to their family situation over the period 1994 to 1996. The average household income of the sample's children is approximately $56,000.

5.2 Regression Results for the Dependent Child Outcome Variables

As mentioned in our methodology section, there are two models which are used for each child outcome dependent variable. The second regression models are reduced form in nature and are compared to the baseline bivariate regression model to observe changes.

5.2.1 Motor and Social Development Scores

An inspection of the results for the bivariate relationship between each of the four income variables and motor and social development can be found in Table 10. Since we have divided the permanent or average income for the period 1994 to 1996 into units of $10,000, we can observe the effect that a one unit change in income would have in standard deviations of our dependent variable. The unstandardized regression coefficient for Average Income 1994-1996 indicates that a change of $10,000 in "permanent" household income is associated with an increase in MSD scores of approximately one-half a point (0.469). The average income coefficient is significant at the 1 per cent level. Our logarithmic income measure is observed to have a coefficient that is similarly significant and positively related to MSD scores for young children. A one unit change in the logarithmic scale is associated with an increase of almost 6 points of the MSD. This represents a magnitude of change of over 40 per cent of a

standard deviation in MSD scores. Observing the coefficients for the categorized household income variable reveals that higher income categories are associated with larger increases in the MSD scale (Table 10). Our reference category for this variable is household incomes less than $20,000. Only the two highest household income category coefficients attain statistical significance. However, these two categories confer on children's MSD scores approximately 3.2 and 4.4 points, respectively, higher scores than children in the lowest income category. Children living in poor households in 1996 were likely to score almost three and one-half points lower on the MSD scale than children in non-poor households. This result is statistically significant at the 1 per cent level.

If we compare the unstandardized coefficients for these four income measures we can gain some idea of the magnitude or relative strength of the effect each income measure has on our dependent variable. The weakest effect is that of the " permanent" average income measure (0.099), then the poverty measure (-0.105), followed closely by the logarithmic income measure (0.109) and finally the highest income category ($65,000 and over) with a standardized coefficient of 0.133. Not surprisingly, having a high household income is significantly associated with higher MSD scores. These results are in keeping with the research literature where the effect of income prior to controlling for other influences is quite strong.

What is the effect on this relationship of adding in control variables? Turning to the results for Model 2 the unstandardized coefficients for the average income and poverty measures are observed to be lower than in Model 1 (0.447 and -3.326 respectively). Controlling for these parental and background characteristics reduces the initially observed effect of income on MSD scores. However, for the logarithmic and the categorized income measures the effect of the controls serves to increase the unstandardized regression coefficients. Whereas a one unit increase in logarithmic income was associated with an increase of 5.8 points on the MSD in Model 1, a similar income increase is now associated with an increase of 6.6 points on the MSD. A comparable result occurs for the categorized income category. Our unstandardized regression coefficients are ordered in the same manner as for Model 1. Children in households with incomes of $65,000 and higher are much more likely to have higher MSD scores.

These results differ from those found in the American literature (Blau, 1999; Mayer, 1997). It may be that certain of our control variables are causally connected to household income in a direct manner or

that the causal relationship is difficult to ascertain temporally. In either case the variable(s) would cause the income effect to be inflated. Nevertheless, our control variables were chosen to meet those used in other such income security studies (Duncan et al., 1998; Duncan and Brooks-Gunn, 1997; Mayer, 1997).

5.2.2 The PPVT Scores

The simple bivariate effect of our four income measures on children's scores on the PPVT are statistically significant and quite considerable in some instances, as with the MSD scores. Raising household incomes by $10,000 would result in an increase, on average, of 1.2 points in children's scores on the PPVT scale, or about 25 per cent of a standard deviation. Being a child in families with household incomes of $65,000 and over, results in PPVT scores which are over 11.5 points higher than children from families with household incomes under $20,000. Being a poor child likely means a lower PPVT score, 7.3 points lower, compared to non-poor children. These results are larger than those observed with the MSD. Both of these scales are standardized with means of 100, so that income changes have a much greater impact on the cognitive development of 4 to 7 year olds than for younger children under the age of 4. The standardized coefficients show that categorized income and logarithmic income have relatively stronger effects than average income and our poverty measure.

The introduction of control variables in Model 2 serves to reduce quite considerably the effect of each of our four income variables. While all four measures remain statistically significant, their impact on children's PPVT scores is much less. Children from higher income families ($65,000 and over) are now seen to have PPVT scores that are approximately 8 points higher than children from lower income families, on average. Poor children score only 4.5 points below non-poor on average. This is still a considerable difference but rather smaller than the previous average gap of 7.3 points found in Model 1.

5.2.3 Behavioural Outcomes

We use six behaviour scales from the NSLCY to measure the social and psychological development of children aged 4 to 11. The results from our Model 1 analysis without controls indicates that children from lower income households are likely to score lower on the prosocial behaviour scale (they are less prosocial), and higher on each of the five other behavioural scales. That is, lower income children are on average more likely to be hyperactive, aggressive, experience emotional disorder-anxiety, display

indirect aggression and commit property offences. A comparison of the standardized regression coefficients shows categorized household income to have the greatest effect on all six behavioural variables, followed by logarithmic household income. Income has its greatest effect on the hyperactivity-inattention, property offences and emotional disorder-anxiety scales. Its effect is least on the prosocial behaviour scale. Nevertheless, despite the fact that income has an effect on these developmental outcomes, the effects are relatively small. For example, a one unit increase of $10,000 in average household income would result in a decrease on the hyperactivity scale of approximately one-seventh of a standard deviation. We would need a $70,000 change in household income to effect a change of one point on the hyperactivity scale which has a standard deviation of 3.6 points.

Introducing controls into the regression models (Model 2) of the behaviour variables acts to decrease the effect of income noticeably (Table 10). The effect of average household income on hyperactivity-inattention and property offences, is almost halved. A small increase in the effect of income on prosocial behaviour is observed after we have controlled for parental and background characteristics. But the overall effect of this increase is extremely small, one-hundredth of a point higher than before the controls were applied for the average household income unstandardized coefficient. Categorized income and logarithmic income are still the strongest variables, when comparing the standardized coefficients. As well, hyperactivity-inattention, property offences and emotional disorder-anxiety still experience the strongest income effects, when comparing standardized coefficients.

5.2.4 Math and Reading Outcomes

Results of the math and reading tests for Children aged 7 to 11 are shown in Table 10. The table figures indicate that income has a greater effect on children's reading scores than on their math scores. A $10,000 increase in average " permanent" household income results in an increase of 0.14 points higher on the reading and 0.1 points on the math scales. Children from higher income households ($65,000 and greater) score on average almost two points (1.713) higher than children from lower income households (less than $20,000) on the reading and math variables. Categorized income and logarithmic income have the strongest effect for both reading and math, when comparing the standardized regression coefficients.

5.2.5 Home Environment Proxies

We now turn to an analysis of the extent to which income is associated with the home environment of the child. As previously mentioned, the proxy variables we have constructed do not encompass the wide range of material and information that the HOME measure used in America is able to capture. In Table 10 we observe that income is not significantly statistically related with our home environment proxy 1 for younger children (ages 2 to 3 years). However, this is not the case for the home environment proxy variables 2, 3 and 4 (for children 4 to 7, 4 to 11, and 7 to 11 respectively). Log income and our income categories reveal relatively strong effects for each of our home environment proxies 2, 3 and 4 (Table 10). Children from higher income households perform considerably better on our scale. Children aged 4 to 7 years from households with incomes equal to or greater than $65,000 score almost one point (0.870) higher on our five point scale than children from families with incomes below $20,000. This relationship is attenuated somewhat when controls are added but is still relatively large (0.676 of a point). These results are duplicated for proxy 3 and proxy 4 but to a lesser degree. Children from higher income families are relatively more likely to have home environments that are cognitively more stimulating than children from lower income homes, as measured with our proxy variables.

Blau (1999) compares the effect of income on the HOME measure to income's effect on a selected number of developmental outcomes, and determines that income has a much larger effect on the HOME measure than on any of the outcomes. We do not claim quite so much, but our results are suggestive that income certainly plays a relatively moderate role in affecting the home environment as measured here. Even with the modest scale our home environment proxy variables (2, 3 and 4) have effects which are comparable in magnitude to those observed for the behavioural variables in the regressions discussed above. The magnitude of the proxy variable effects are not however, as large as those observed for the PPVT or the Reading scores. Our analysis however does seem to support the view that income does affect input demand, as found by Blau (1999). However, this is a very tentative finding given the nature of the our home environment proxy variables and the relatively moderate to weak associations we found.

6. Discussion

The simple descriptive results of section four reveal that a large proportion of children face changes in their economic circumstances over the relatively short period of two years. As well, we observed that changes in family structure and number of earners in the labour market have considerable effect on the economic circumstances of children. The evidence presented demonstrates that these fluctuations in children's household incomes and the persistence of a large proportion of children in poverty situations, are in keeping with evidence found in other studies (Picot et al., 1999; Duncan and Brooks-Gunn, 1997; Duncan et al., 1994).

Our cross-table comparisons of the variations in household income and changes in children's behavioural and cognitive outcomes did not reveal an easily discernible relationship. Large proportions of children did experience changes in their behavioural and cognitive scores from 1994 to 1996, as well as changes in their household incomes. There are individual instances where some differences in child outcomes were observed to be related to changes in household income. However, overall these changes did not seem to be noticeably related to changes in the household income of children.

What might account for the lack of an easily noticeable relationship? A likely reason for the weak relationship is that health and development variables are weakly linked to income changes in the short-run. The research literature suggests that the effect of income on children's outcomes is relatively small to begin with (Blau, 1999; Duncan et al., 1998; Mayer, 1997) and may be particularly so with the behavioural variables we used. This suggests that it may be more difficult for us to observe any relationship in a cross-table form.

Our regression results in Table 10 are less mixed than the cross-table results. In the majority of simple bivariate relationships our four income measures are found to be significantly related to children's cognitive, academic and behavioural outcomes. There are exceptions when observing the categorized income variables, where lower income categories are frequently not significantly related to different outcome scores. When we compare the standardized coefficients of the bivariate relationships we observe that income has its largest effect on the PPVT, while the smallest is for the prosocial behaviour

scale. Nevertheless, the relationship between income and the child outcomes examined in this research is relatively weak to moderate.

Introduction of the control variables into the regression had the effect of reducing the income coefficients for most of the outcomes. The " true" effect of income for the majority of the outcomes is found to be much lower than we had observed in the simple bivariate relationships. As a result of the controls we see that the standardized income coefficients for the child outcomes are now much closer in size to those for prosocial behaviour (our lowest bivariate outcome result). This effect is similar to the findings of Blau (1999) and Mayer (1997), where the initial income effect is reduced by the introduction of parental background characteristics and other controls.

Children's home environment has been identified by American researchers as being an important variable for the relationship between income and outcomes (Blau, 1999; Jekielek et al., 1998; Smith et al., 1997). Our home environment proxy variable is not based on the same inventory of items as the HOME scale used in America. Nevertheless, we do find in Table 10 that it is related moderately with income, similar to what has been found in previous research. If we compare the magnitude of the standardized regression coefficients for our income variables in our home environment proxy regressions we note that the home environment variables are considerably higher for children from higher income families.

The positive effect of income on the home environment proxy variables is most apparent for the log income and categorical income variables and for older children. Children living in families with incomes greater than $65,000 scored much higher on our home environment scale than children in families with incomes below $20,000. These results suggest that income does play a role in affecting the home environment of the children and the demands and choices made by parents. Our results are somewhat different from those of Blau (1999) where income had a larger influence on behavioural outcomes than on cognitive and learning outcomes. However, they are not dissimilar to those of Duncan et al. (1998) where income had a larger influence on achievement and ability related outcomes rather than on behavioural.

It should be remembered that our findings do not control for all possible background characteristics of the parents or household income. Many of the studies discussed in our literature review used geographic and grandparent data of the children as controls. These variables are not available on the NLSCY. Overall,

the results suggest that income is important for children's development particularly for the PPVT and reading scores, but that in many cases the relationship is not uncomplicated. The relationship may become clearer with the continuing growth in the number of cycles from the NLSCY. Our conclusions, therefore, are very preliminary given that we observed income and developmental changes over such a short period of time. Further research into these relationships would provide a clearer picture of the pathways through which income affects children's outcomes.

7. Policy Implications

This research has a number of broad policy implications, bearing in mind that there may be some weaknesses to the model, the most important of which is the fact that the data we have used cover only a very short span of time, from 1994 to 1996. Until we have a longer view over an extended period of time, our results can only be considered as preliminary. Nonetheless, our research results show, as previous work in America has found, that the direct effect of income on children's developmental outcomes varies from moderate to relatively weak as more controls are applied.

Our findings, even though showing a relatively weak relationship between income and children's developmental outcomes, can provide some support for continuing to invest funds in direct transfers to lower income families. As Mayer (1997) points out, while the effect of income on any single child outcome may be relatively small, the cumulative effect of higher income over a broad range of outcomes may in fact be quite substantial. Our findings show that income does have a relatively weak to moderate effect across a range of developmental outcomes that could be cumulative. However, Blau (1999) maintains that we cannot avoid these weak relationships. One of the consequences of this is that Blau suggests that rather than providing direct transfers to families governments should instead put greater investment in the provision of health and education to parents and children as a way to get better child development outcomes.

Our data regarding the proportion of children living in persistent poverty over the 1994 to 1996 period, suggests that the income security of some children is at greater risk than others. Indeed, Duncan et al. (1998) contend that the use of income transfers to eliminate the deepest and most persistent poverty for children in these circumstances is very important since this will lead to better child outcomes. It would seem prudent therefore that policies be aimed at least at maintaining the current level of transfers to the poorest families with children. If there are to be changes to direct transfers then the suggestion by Duncan et al. (1998) and Blau (1999) that there be resources allocated to the poorest families with children to lend support for health and education, seems wise.

Given the importance of the relationship between income and the home environment variable and the likelihood that this has an effect on children's outcomes, it would also be sensible to investigate if there are

possible avenues by which this could be supported. It may be possible to investigate ways to provide for better home environments for children. The variables composing the home environment variable include literacy, children's activities and parents participating in their children's lives. Policies which aid these activities either directly or otherwise, would aid in furthering children's well-being. These could include literacy policies, or providing environments conducive to parent-child interaction, such as recreational areas or even policies which make it easier for families to spend time together.

8. Conclusion

Our study began by asking a series of questions regarding the impact of income security on children's development. We arranged our analysis of these questions into three major areas of interest, income security, family structure, and labour market. The major findings from previous research suggested that children living in families which experience low income or income fluctuations, divorce or separation, or changes to the labour market status of the parents such as job loss or working more hours, tended to have relatively poorer outcomes than children not encountering these changes. Our analysis, using data from the 1994 and 1996 cycles of the NLSCY, reveals that a large proportion of children face substantial changes in their economic circumstances over a relatively short period of time – two years. Between 1994 and 1996 we observed that over 32 per cent of children had experienced an increase in their household income of 15 per cent or more. An equally large proportion (26 per cent) of children had experienced a decrease of 15 per cent or more. Yet these large fluctuations mask the sizeable proportion of children (17 per cent) whose household incomes remained below the poverty line in both 1994 and 1996. These findings demonstrate that income security for a large number of children's families can vary quite widely. But for some children their family's economic circumstances remained relatively low and fixed.

We also addressed the effect of labour market and family structural changes. Our results demonstrate that children who face changes in their family structure or in the labour market relationship of their parents are more likely to observe alterations in the economic security of their families. However, the results of our cross-table analysis show that there is no simple or direct relationship found between changes in family economic security and children's outcomes. The lack of an easily discernible relationship may be due to the fact that behavioural changes are relatively longer term outcomes and are not as easily influenced by short term family income fluctuations.

To determine the direct effect of income on child outcomes, we employed a reduced form OLS regression model first observing the effect of income without any control variables, then adding a number of control variables. In the bivariate case, income is found to be a significant factor affecting children's cognitive and academic outcomes, and less so children's behavioural outcomes, but that the substantive effect of income is relatively weak to moderate. After the application of the first group of control

variables, income's effect is diminished, in some cases quite considerably, but it still significantly affects the majority of the child

outcomes – again, the nature of the income and child outcome relationship is still relatively weak, even though it is statistically significant.

Lastly, the effect of income on the home environment of the children demonstrates that income is important for determining the demands and choices that families make. Children from relatively affluent families scored higher on our proxy measures of the home environment. While preliminary, these results are suggestive of the fact that the home environment is one area by which income comes to influence children's development.

The analysis in this research paper has demonstrated that a family's income security has an effect on children's development. This effect on children's developmental outcomes while weak, after controlling for some variables, does persist for many of the outcomes. Our study only observed the direct effect of income security on children's outcomes. However, there may be a number of paths through which a family's income security affects these outcomes including the home environment. An analysis of these pathways are needed to evaluate the extent to which income and poverty dynamics interact with other variables to affect children's outcomes. Our examination of the relationship between income security and children's development continues as we model the relationship and develop our understanding of the pathways through which economic circumstances affects children's well-being.

Appendix

Data Tables and Regression Results

Table 1
Home Environment Proxy Variable Distributions

Proxy Scale Score	Home Environment Proxy Variables			
	Proxy 1 (2-3 yrs)	Proxy 2 (4-7 yrs)	Proxy 3 (4-11 yrs)	Proxy 4 (7-13 yrs)
0[1]	0.10	0.05	0.02	0.02
1	2.05	1.44	1.31	1.07
2	6.71	8.85	9.20	9.24
3	23.65	36.04	35.14	33.43
4	67.50	53.63	54.33	56.25
Percent	100.00	100.00	100.00	100.00
Number	694,600	1,487,900	2,888,700	1,782,900

[1] The user is advised that these estimates are associated with very high coefficients of variation. Conclusions based on these data will be unreliable, and most likely invalid.

Note: Higher scale scores indicate better home environments.

Source: Statistics Canada's National Longitudinal Survey of Children and Youth, 1994-95 and 1996-97, share file.

Table 2
Home Environment Proxy Variables - Cronbach's Alpha and Income Correlations

Home Environment Proxy Variables	Income Variables		
	Cronbach's Alpha	Permanent Income (units of $10,000)	Permanent Income (Natural Log)
Proxy 1 (2-3 yrs)	0.3609*	0.024	0.022
Proxy 2 (4-7 yrs)	0.1987*	0.255*	0.276*
Proxy 3 (4-11 yrs)	0.1220*	0.202*	0.223*
Proxy 4 (7-13 yrs)	0.1238*	0.156*	0.167*

*Indicates figure is significant at the 5% level.

Source: Statistics Canada's National Longitudinal Survey of Children and Youth, 1994-95 and 1996-97, share file.

Table 3
Categorized Household Income from 1994 to 1996 (Constant 1996 Dollars) for Children Aged 2 to 13 Years in 1996

Household Income 1994[a]	Household Income, 1996[a]							
	Below $19,999	$20,000 - $29,000	$30,000 - $39,000	$40,000 - $49,000	$50,000 and more	Row Total	Column Total	Number
Below $19,999	59.7%	20.0%	10.5%	6.6%	3.2%	100%	14.4%	642,000
$20,000 - $29,000	22.5%	34.0%	28.0%	6.9%	8.6%	100%	11.1%	493,000
$30,000 - $39,000	8.6%	16.0%	33.7%	25.1%	16.5%	100%	14.2%	630,000
$40,000 - $49,000	4.8%	6.0%	18.3%	31.5%	39.4%	100%	14.4%	642,000
$50,000 and more	1.3%	2.2%	4.1%	9.5%	82.9%	100%	45.8%	2,036,000
Total	13.7%	10.8%	13.9%	14.2%	47.4%	100%	100%	4,443,000

Source: National Longitudinal Survey of Children and Youth, 1994-95 and 1996-97, share file.

[a] Reported in constant 1996 dollars.

Table 4

Proportional Change in Household Income from 1994 to 1996 (Constant 1996 Dollars) for Children Aged 2 to 13 Years in 1996

Household Income	Percent	Number
Decrease of 25% or more	16.8	748,000
Decrease between 15% - 24.9%	9.2	409,000
Decrease between 5% - 14.9%	10.7	474,000
Decrease or Increase +/- 5%	18.4	818,000
Increase between 5% - 14.9%	12.7	565,000
Increase between 15% - 24.9%	9.1	402,000
Increase of 25% or more	23.1	1,027,000
Total	100	4,443,000

Source: National Longitudinal Survey of Children and Youth, 1994/95 and 1996/97, share file.

Table 5

Change in Poverty Status from 1994 to 1996 for Children Aged 2 to 13 Years in 1996

Poverty Status, 1994	Poverty Status, 1996			
	Below poor	Above poor	Percent	Total
Below poor	16.8%	6.9%	23.7%	1,028,000
Above poor	7.4%	68.9%	76.3%	3,311,000
Row Percent	24.2%	75.8%	100.0%	
Total	1,051,000	3,288,000	4,339,000	

Note: Poverty status is determined by using the pre-tax Low-income cut-off (LICO) for the respective survey.
Source: National Longitudinal Survey of Children and Youth, 1994/95 and 1996/97, share file.

Table 6

Change in Family Structure by Change in Poverty Status from 1994 to 1996 for Children Aged 2 to 13 Years in 1996

Poverty Status of Child's Family, 1994 to 1996	Child's Family Status, 1994 to 1996				
	Stayed Two-Parent	Two-Parent to One-Parent	One Parent to Two-Parent	Stayed One-Parent	Total
Stayed poor	9.3%	28.7%	33.8%	56.8%	16.8%
Move out of poverty	5.6%	2.1%	30.7%	10.7%	6.8%
Move into poverty	6.1%	27.9%	8.1%	8.7%	7.4%
Stayed non-poor	79.0%	41.3%	27.4%	23.8%	69.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
Row Percent	80.4%	4.2%	2.8%	12.7%	100.0%
Number	3,480,000	181,000,000	120,000	550,000	4,331,000

Note: Poverty status is determined by using the pre-tax Low-income cut-off (LICO) for the respective survey year.
Source: National Longitudinal Survey of Children and Youth, 1994/95 and 1996/97, share file.

Table 7

Change in Number of Earners in Child's Family by Change in Poverty Status from 1994 to 1996 for Children Aged 2 to 13 Years in 1996

Poverty Status of Child's Family, 1994 to 1996	Number of Earners, 1994 to 1996			
	Decrease	No Change	Increase	Total
Stayed poor	26.1%	13.4%	24.2%	16.8%
Move out of poverty	6.6%	4.9%	11.9%	6.5%
Move into poverty	18.5%	6.0%	6.9%	7.2%
Stayed non-poor	48.8%	75.7%	56.9%	69.4%
Total	100.0%	100.0%	100.0%	100.0%
Row Percent	8.2%	70.0%	21.7%	100.0%
Number	342,000	2,909,000	902,000	4,152,000

Note: Poverty status is determined by using the pre-tax Low-income cut-off (LICO) for the respective survey
Source: National Longitudinal Survey of Children and Youth, 1994/95 and 1996/97, share file

Table 8a

Change in Motor and Social Development by Proportional Change in Household Income from 1994 to 1996 (Constant 1996 Dollars) for Children Aged 2 to 3 Years in 1996

Motor and Social Development Score, 1994 to 1996	Household Income, 1994 to 1996								
	Drop (25%+)	Drop (15-24.9%)	Drop (5-14.9%)	Drop/Increase (<5%)	Increase (5-14.9%)	Increase (15-24.9%)	Increase (25%+)	Total	Tau-B
Worsened	18.6%	25.6%	16.3%	10.8%	22.0%	18.8%	16.5%	17.7%	
Stayed the same	58.2%	62.5%	61.4%	65.5%	53.2%	57.7%	65.7%	61.3%	
Improved	23.3%	12.0%	22.2%	23.8%	24.8%	23.4%	17.8%	21.0%	
Total	100%	100%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0	0.004
Number	115,000	58,000	58,000	96,000	67,000	50,000	143,000	588,00	

Source: National Longitudinal Survey of Children and Youth, 1994/95 and 1996/97, share file

Table 8b

Change in PPVT by Proportional Change in Household Income from 1994 to 1996 (Constant 1996 Dollars) for Children Aged 6 to 7 Years in 1996

PPVT Standardized Scale Score, 1994 to 1996	Household Income, 1994 to 1996								
	Drop (25%+)	Drop (15-24.9%)	Drop (5-14.9%)	Drop/Increase (<5%)	Increase (5-14.9%)	Increase (15-24.9%)	Increase (25%+)	Total	Tau-B
Worsened	15.0% *	19.4% *	20.1% *	20.2%	21.4%	10.9% *	9.2%	16.1%	
Stayed the same	66.7%	64.9%	69.2%	65.9%	70.4%	67.0%	79.2%	70.3%	
Improved	18.4%	15.7% *	10.7% *	13.9% *	8.2% *	22% *	11.6% *	13.6%	
Total	100%	100%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.026
Number	46,000	34,000	38,000	53,000	57,000	34,000	81,000	343,000	

* These estimates are associated with very high coefficients of variation. Conclusions based on these data will be unreliable and most likely invalid
Source: National Longitudinal Survey of Children and Youth, 1994/95 and 1996/97, share file

Table 8c

Change in Hyperactivity-Inattention by Proportional Change in Household Income from 1994 to 1996 (Constant 1996 Dollars) for Children Aged 6 to 11 Years in 1996

Hyperactivity-Inattention Score, 1994 to 1996	Household Income, 1994 to 1996								
	Drop (25%+)	Drop (15-24.9%)	Drop (5-14.9%)	Drop/Increase (<5%)	Increase (5-14.9%)	Increase (15-24.9%)	Increase (25%+)	Total	Tau-B
Worsened	5.4%	3.7%[1]	6.8%[1]	4.6%	4.2%	4.1%	7.2%	5.8%	
Stayed the same	88.6%	89.1%	86.7%	88.8%	90.6%	89.6%	88.5%	88.8%	
Improved	6.0%	7.2%	6.5%	6.6%	5.2%	6.3%	4.3%	5.4%	
Total	100%	100%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	-0.030*
Number	354,000	187,000	231,000	419,000	291,000	204,000	475,000	2,161,000	

[1] These estimates are associated with very high coefficients of variation. Conclusions based on these data will be unreliable, and most likely invalid.

* Indicates figure is significant at the 5% level.

Source: National Longitudinal Survey of Children and Youth, 1994/95 and 1996/97, share file.

Table 8d

Change in Prosocial Behaviour by Proportional Change in Household Income from 1994 to 1996 (Constant 1996 Dollars) for Children Aged 6 to 11 Years in 1996

Prosocial Behaviour Score, 1994 to 1996	Household Income, 1994 to 1996								
	Drop (25%+)	Drop (15-24.9%)	Drop (5-14.9%)	Drop/Increase (<5%)	Increase (5-14.9%)	Increase (15-24.9%)	Increase (25%+)	Total	Tau-B
Worsened	4.6%	6.8%[1]	3.4%[1]	2.5%[1]	0.9%[1]	5.8%	3.8%	4.0%	
Stayed the same	88.9%	85.4%	89.1%	86.7%	88.1%	84.1%	89.4%	88.1%	
Improved	6.4%	7.8%	7.5%	10.7%	11.0%	10.1%	6.8%	7.9%	
Total	100%	100%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	-0.019*
Number	330,000	181,000	214,000	381,000	271,000	188,000	435,000	2,000,000	

[1] These estimates are associated with very high coefficients of variation. Conclusions based on these data will be unreliable, and most likely invalid.

* Indicates figure is significant at the 5% level.

Source: National Longitudinal Survey of Children and Youth, 1994/95 and 1996/97, share file.

Table 8e

Change in Emotional-Disorder Anxiety by Proportional Change in Household Income from 1994 to 1996 (Constant 1996 Dollars) for Children Aged 6 to 11 Years in 1996

Emotional-Disorder Anxiety Score, 1994 to 1996	Household Income, 1994 to 1996								
	Drop (25%+)	Drop (15-24.9%)	Drop (5-14.9%)	Drop/Increase (<5%)	Increase (5-14.9%)	Increase (15-24.9%)	Increase (25%+)	Total	Tau-B
Worsened	10.3%	5.9%	8.4%	8.0%	8.9%	12.7%	9.0%	9.1%	
Stayed the same	81.4%	82.8%	84.7%	82.8%	84.5%	82.1%	84.7%	83.8%	
Improved	8.3%	11.3%	6.9%	9.2%	6.6%	5.2%	6.3%	7.1%	
Total	100%	100%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	-0.029*
Number	356,000	186,000	230,000	425,000	292,000	204,000	479,000	2,173,000	

* Indicates figure is significant at the 5% level.

Source: National Longitudinal Survey of Children and Youth, 1994/95 and 1996/97, share file.

Table 8f

Change in Conduct Disorder-Physical Aggression by Proportional Change in Household Income from 1994 to 1996 (Constant 1996 Dollars) for Children Aged 6 to 11 Years in 1996

Conduct Disorder-Physical Aggression, 1994 to 1996	Household Income, 1994 to 1996								
	Drop (25%+)	Drop (15-24.9%)	Drop (5-14.9%)	Drop/Increase (<5%)	Increase (5-14.9%)	Increase (15-24.9%)	Increase (25%+)	Total	Tau-B
Worsened	5.3%	5.0%[1]	7.3%	5.3%	8.0%	7.7%	5.1%	6.5%	
Stayed the same	84.5%	85.4%	82.4%	87.6%	84.1%	81.0%	86.5%	85.2%	
Improved	10.2%	9.6%	10.3%	7.1%	7.9%	11.3%	8.3%	8.3%	
Total	100%	100%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	-0.014
Number	354,000	186,000	230,000	419,000	292,000	205,000	478,000	2,165,000	

[1] The user is advised that these estimates are associated with very high coefficients of variation. Conclusions based on these data will be unreliable, and most likely invalid.

* Indicates figure is significant at the 5% level.

Source: National Longitudinal Survey of Children and Youth, 1994-95 and 1996-97, share file.

Table 8g

Change in Indirect Aggression by Proportional Change in Household Income from 1994 to 1996 (Constant 1996 Dollars) for Children Aged 6 to 11 Years in 1996

Indirect Aggression Score, 1994 to 1996	Household Income, 1994 to 1996								
	Drop (25%+)	Drop (15-24.9%)	Drop (5-14.9%)	Drop/Increase (<5%)	Increase (5-14.9%)	Increase (15-24.9%)	Increase (25%+)	Total	Tau-B
Worsened	8.4%	12.1%	6.9%	6.0%	13.1%	6.6%	9.3%	8.8%	
Stayed the same	83.6%	80.9%	87.2%	85.8%	82.4%	90.3%	82.7%	84.8%	
Improved	8.0%	7.0%	5.9%	8.2%	4.5%*	3.1%	8.0%	6.4%	
Total	100%	100%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.012
Number	333,000	176,000	216,000	390,000	269,000	179,000	446,000	2,008,000	

* Indicates figure is significant at the 5% level.

Source: National Longitudinal Survey of Children and Youth, 1994-95 and 1996-97, share file.

Table 8h

Change in Property Offences Score by Proportional Change in Household Income from 1994 to 1996 (Constant 1996 Dollars) for Children Aged 6 to 11 Years in 1996

Property Offences Score, 1994 to 1996	Household Income, 1994 to 1996								
	Drop (25%+)	Drop (15-24.9%)	Drop (5-14.9%)	Drop/Increase (<5%)	Increase (5-14.9%)	Increase (15-24.9%)	Increase (25%+)	Total	Tau-B
Worsened	4.4%	4.0%[1]	2.9%[1]	3.0%	3.4%[1]	5.7%	5.8%	4.8%	
Stayed the same	89.5%	85.1%	90.8%	91.0%	91.7%	84.8%	87.9%	88.9%	
Improved	6.0%	10.9%	6.3%	6.0%	4.9%	9.4%	6.4%	6.3%	
Total	100%	100%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.020*
Number	357,000	188,000	230,000	422,000	294,000	206,000	479,000	2,176,000	

[1] These estimates are associated with very high coefficients of variation. Conclusions based on these data will be unreliable, and most likely invalid.

* Indicates figure is significant at the 5% level.

Source: National Longitudinal Survey of Children and Youth, 1994-95 and 1996-97, share file.

Table 9
Univariate Descriptive Analysis for Regressions

	Motor and Social Development Score (2-3 yrs.)		Standard Score for the PPVT-R (4-7 yrs.)	
	Mean	S.D.	Mean	S.D.
Relevant Dependent Variable Score	7.10	0.98	6.55	1.00
Average Income 1994 - 1996 ($10,000	4.96	2.99	5.21	3.29
Log of Average Income 1994 – 1996	1.43	0.60	1.47	0.62
(Household Income <$20,000)	0.13	0.34	0.14	0.34
Household Income $20,000 -$34,999	0.21	0.41	0.20	0.40
Household Income $35,000 - $49,999	0.24	0.43	0.20	0.40
Household Income $50,000 - $64,999	0.18	0.39	0.18	0.39
Household Income $65,000 +	0.24	0.43	0.28	0.45
Below LICO (1996) (Yes=1)	0.26	0.44	0.24	0.43
Number of Persons in Economic Family	4.19	1.20	4.27	1.18
Mother's Age at Birth of Child	28.89	4.82	2874	4.96
Gender of Child (female=1)	0.49	0.50	0.50	0.50
Number of Siblings	1.21	1.05	1.35	1.04
Immigrant Mother (yes=1)	0.17	0.38	0.16	0.36
Mother's Education: < High School	0.12	0.32	0.12	0.32
Mother's Education: High School	0.17	0.38	0.20	0.40
(Mother's Education: Some Post-Secondary)	0.28	0.45	0.27	0.44
Mother's Education: Post-Secondary (College/ Trade)	0.25	0.43	0.26	0.44
Mother's Education: Post-Secondary (University)	0.19	0.39	0.17	0.37
Mother's Employment Status: (Works FT)	0.57	0.50	0.62	0.48
Mother's Employment Status: Works Part of the Year	0.11	0.32	0.09	0.28
Mother's Employment Status: Does Not Work	0.32	0.47	0.29	0.45
Lone-Parent (Yes=1)	0.13	0.34	0.14	0.35
(Family Structure Change: No Change)	0.94	0.24	0.94	0.24
Family Structure Change: 2 to 1 Parent	0.04	0.20	0.03	0.18
Family Structure Change: 1 to 2 Parent	0.02	0.16	0.03	0.18
Area of Residence: (Rural)	0.13	0.33	0.13	0.33
Area of Residence: Urban < 100,000	0.23	0.42	0.23	0.42
Area of Residence: Urban 100,000 +	0.65	0.48	0.64	0.48

Table 9 (continued)

	Number of Correct Reading Scores		Number of Correct Math Scores	
	Mean	S.D.	Mean	S.D.
Relevant Dependent Variable Score	2.90	0.99	2.41	1.00
Average Income 1994 - 1996 ($10,000	5.61	3.71	5.61	3.71
Log of Average Income 1994 - 1996	1.54	0.61	1.55	0.61
(Household Income <$20,000)	0.10	0.30	0.10	0.30
Household Income $20,000 -$34,999	0.19	0.39	0.18	0.39
Household Income $35,000 - $49,999	0.22	0.41	0.22	0.41
Household Income $50,000 - $64,999	0.19	0.39	0.19	0.39
Household Income $65,000 +	0.31	0.46	0.31	0.46
Below LICO (1996) (Yes=1)	0.22	0.41	0.22	0.41
Number of Persons in Economic Family	4.34	1.11	4.34	1.11
Mother's Age at Birth of Child	28.00	4.86	28.00	4.86
Gender of Child (female=1)	0.50	0.50	0.50	0.50
Number of Siblings	1.46	0.96	1.46	0.96
Immigrant Mother (yes=1)	0.17	0.38	0.17	0.38
Mother's Education: < High School	0.12	0.32	0.12	0.32
Mother's Education: High School	0.19	0.39	0.19	0.39
(Mother's Education: Some Post-Secondary)	0.29	0.45	0.29	0.45
Mother's Education: Post-Secondary (College/ Trade)	0.23	0.42	0.23	0.42
Mother's Education: Post-Secondary (University)	0.16	0.37	0.16	0.37
Mother's Employment Status: (Works FT)	0.71	0.45	0.72	0.45
Mother's Employment Status: Works Part of the Year	0.07	0.25	0.07	0.25
Mother's Employment Status: Does Not Work	0.26	0.44	0.26	0.44
Lone-Parent (Yes=1)	0.16	0.37	0.16	0.37
(Family Structure Change: No Change)	0.94	0.24	0.94	0.24
Family Structure Change: 2 to 1 Parent	0.03	0.18	0.03	0.18
Family Structure Change: 1 to 2 Parent	0.02	0.14	0.02	0.14
Area of Residence: (Rural)	0.13	0.33	0.13	0.33
Area of Residence: Urban < 100,000	0.24	0.43	0.24	0.43
Area of Residence: Urban 100,000 +	0.63	0.48	0.63	0.48

Table 9 (continued)

	Hyperactivity-Inattention Score (4-11 yrs.)		Prosocial Behavior Score (4-11 yrs.)	
	Mean	S.D.	Mean	S.D.
Relevant Dependent Variable Score	1.25	1.00	3.34	0.99
Average Income 1994 - 1996 ($10,000	5.37	3.60	5.35	3.61
Log of Average Income 1994 - 1996	1.49	0.62	1.49	0.62
(Household Income < $20,000)	0.12	0.32	0.12	0.32
Household Income $20,000 -$34,999	0.20	0.40	0.20	0.40
Household Income $35,000 - $49,999	0.21	0.41	0.21	0.41
Household Income $50,000 - $64,999	0.18	0.39	0.19	0.39
Household Income $65,000 +	0.28	0.45	0.28	0.45
Below LICO (1996) (Yes=1)	0.24	0.43	0.23	0.43
Number of Persons in Economic Family	4.34	1.18	4.35	1.18
Mother's Age at Birth of Child	28.43	4.98	28.40	5.01
Gender of Child (female=1)	0.49	0.50	0.49	0.50
Number of Siblings	1.44	1.04	1.44	1.04
Immigrant Mother (yes=1)	0.16	0.37	0.16	0.37
Mother's Education < High School	0.12	0.32	0.12	0.32
Mother's Education High School	0.19	0.40	0.20	0.40
(Mother's Education Some Post-Secondary)	0.29	0.45	0.29	0.45
Mother's Education Post-Secondary (College/Trade)	0.24	0.43	0.24	0.43
Mother's Education Post-Secondary (University)	0.16	0.36	0.15	0.36
Mother's Employment Status (Works FT)	0.66	0.47	0.66	0.47
Mother's Employment Status Works Part of the Year	0.08	0.27	0.08	0.27
Mother's Employment Status Does Not Work	0.26	0.44	0.26	0.44
Lone-Parent (Yes=1)	0.16	0.36	0.16	0.37
(Family Structure Change No Change)	0.94	0.24	0.94	0.24
Family Structure Change 2 to 1 Parent	0.03	0.18	0.03	0.18
Family Structure Change 1 to 2 Parent	0.03	0.16	0.03	0.16
Area of Residence (Rural)	0.13	0.33	0.13	0.33
Area of Residence Urban < 100,000	0.25	0.43	0.25	0.43
Area of Residence Urban 100,000 +	0.62	0.49	0.62	0.49

Table 9 (continued)

	Emotional Disorder-Anxiety Score (4-11 yrs.)		Aggression Score (Age 4-11 yrs.)	
	Mean	S D	Mean	S D
Relevant Dependent Variable Score	0 98	1 00	0 74	1 00
Average Income 1994 - 1996 ($10,000	5 37	3 59	5 36	3 59
Log of Average Income 1994 - 1996	1 49	0 62	1 49	0 62
(Household Income <$20,000)	0 12	0 32	0 12	0 32
Household Income $20,000 -$34,999	0 20	0 40	0 20	0 40
Household Income $35,000 - $49,999	0 21	0 41	0 21	0 41
Household Income $50,000 - $64,999	0 18	0 39	0 19	0 39
Household Income $65,000 +	0 28	0 45	0 28	0 45
Below LICO (1996) (Yes=1)	0 24	0 43	0 23	0 43
Number of Persons in Economic Family	4 34	1 18	4 34	1 18
Mother's Age at Birth of Child	28 44	4 97	28 44	4 98
Gender of Child (female=1)	0 49	0 50	0 49	0 50
Number of Siblings	1 44	1 04	1 44	1 04
Immigrant Mother (yes=1)	0 17	0 37	0 17	0 37
Mother's Education < High School	0 12	0 32	0 12	0 32
Mother's Education High School	0 20	0 40	0 20	0 40
(Mother's Education Some Post-Secondary)	0 29	0 45	0 29	0 45
Mother's Education Post-Secondary (College/ Trade)	0 24	0 43	0 24	0 43
Mother's Education Post-Secondary (University)	0 16	0 36	0 16	0 36
Mother's Employment Status (Works FT)	0 66	0 47	0 66	0 47
Mother's Employment Status Works Part of the Year	0 08	0 27	0 08	0 27
Mother's Employment Status Does Not Work	0 26	0 44	0 26	0 44
Lone-Parent (Yes=1)	0 16	0 36	0 16	0 37
(Family Structure Change No Change)	0 94	0 24	0 94	0 24
Family Structure Change 2 to 1 Parent	0 03	0 18	0 03	0 18
Family Structure Change 1 to 2 Parent	0 03	0 17	0 03	0 16
Area of Residence (Rural)	0 13	0 33	0 13	0 33
Area of Residence Urban < 100,000	0 25	0 43	0 25	0 43
Area of Residence Urban 100,000 +	0 62	0 48	0 62	0 48

Table 9 (continued)

	Indirect Aggression Score (4-11 yrs.)		Property Offences Score (Age 4-11 yrs.)	
	Mean	S.D.	Mean	S.D.
Relevant Dependent Variable Score	0.68	1.00	0.66	1.00
Average Income 1994 - 1996 ($10,000	5.35	3.60	5.36	3.59
Log of Average Income 1994 - 1996	1.49	0.62	1.49	0.62
(Household Income <$20,000)	0.12	0.32	0.12	0.32
Household Income $20,000 -$34,999	0.20	0.40	0.20	0.40
Household Income $35,000 - $49,999	0.21	0.41	0.21	0.41
Household Income $50,000 - $64,999	0.19	0.39	0.19	0.39
Household Income $65,000 +	0.28	0.45	0.28	0.45
Below LICO (1996) (Yes=1)	0.24	0.43	0.24	0.43
Number of Persons in Economic Family	4.33	1.18	4.34	1.18
Mother's Age at Birth of Child	28.44	4.96	28.44	4.98
Gender of Child (female=1)	0.49	0.50	0.49	0.50
Number of Siblings	1.43	1.04	1.44	1.04
Immigrant Mother (yes=1)	0.17	0.37	0.17	0.37
Mother's Education: < High School	0.12	0.32	0.12	0.32
Mother's Education: High School	0.20	0.40	0.20	0.40
(Mother's Education: Some Post-Secondary)	0.29	0.45	0.29	0.45
Mother's Education: Post-Secondary (College/Trade)	0.24	0.43	0.24	0.43
Mother's Education: Post-Secondary (University)	0.15	0.36	0.16	0.36
Mother's Employment Status: (Works FT)	0.66	0.47	0.66	0.47
Mother's Employment Status: Works Part of the Year	0.08	0.27	0.08	0.27
Mother's Employment Status: Does Not Work	0.26	0.44	0.26	0.44
Lone-Parent (Yes=1)	0.16	0.36	0.16	0.36
(Family Structure Change: No Change)	0.94	0.24	0.94	0.24
Family Structure Change: 2 to 1 Parent	0.03	0.18	0.03	0.18
Family Structure Change: 1 to 2 Parent	0.03	0.16	0.03	0.17
Area of Residence: (Rural)	0.13	0.33	0.13	0.33
Area of Residence: Urban < 100,000	0.24	0.43	0.25	0.43
Area of Residence: Urban 100,000 +	0.62	0.48	0.62	0.48

Table 9 (continued)

	Home Environment Proxy 1 (2-3 yrs.)		Home Environment Proxy 2 (4-7 yrs.)	
	Mean	S D	Mean	S D
Relevant Dependent Variable Score	5 19	1 05	4 90	1 04
Average Income 1994 - 1996 ($10,000	5 00	3 00	1 46	0 62
Log of Average Income 1994 -1996	1 44	0 60	1 46	0 62
(Household Income <$20,000)	0 12	0 32	0 12	0 32
Household Income $20,000 -$34,999	0 21	0 40	0 20	0 40
Household Income $35,000 - $49,999	0 24	0 43	0 20	0 40
Household Income $50,000 - $64,999	0 18	0 38	0 18	0 39
Household Income $65,000 +	0 25	0 43	0 27	0 44
Below LICO (1996) (Yes=1)	0 26	0 44	0 26	0 44
Number of Persons in Economic Family	4 17	1 18	4 26	1 17
Mother's Age at Birth of Child	28 96	4 77	28 69	5 02
Gender of Child (female=1)	0 50	0 50	0 49	0 50
Number of Siblings	1 19	1 03	1 35	1 01
Immigrant Mother (yes=1)	0 17	0 37	0 17	0 37
Mother's Education: < High School	0 12	0 32	0 12	0 32
Mother's Education: High School	0 17	0 37	0 19	0 40
(Mother's Education: Some Post-Secondary)	0 28	0 45	0 28	0 45
Mother's Education: Post-Secondary (College/ Trade)	0 25	0 43	0 26	0 44
Mother's Education: Post-Secondary (University)	0 19	0 40	0 16	0 36
Mother's Employment Status: (Works FT)	0 57	0 49	0 63	0 48
Mother's Employment Status: Works Part of the Year	0 12	0 32	0 09	0 29
Mother's Employment Status: Does Not Work	0 26	0 44	0 26	0 44
Lone-Parent (Yes=1)	0 13	0 34	0 16	0 36
(Family Structure Change: No Change)	0 94	0 24	0 94	0 24
Family Structure Change: 2 to 1 Parent	0 04	0 20	0 04	0 19
Family Structure Change: 1 to 2 Parent	0 03	0 16	0 03	0 18
Area of Residence: (Rural)	0 13	0 33	0 13	0 33
Area of Residence: Urban < 100,000	0 23	0 42	0 23	0 42
Area of Residence: Urban 100,000 +	0 65	0 48	0 64	0 48

Table 9 (continued)

	Home Environment Proxy 3 (3-11 yrs.)		Home Environment Proxy 4 (7-11 yrs.)	
	Mean	S.D.	Mean	S.D.
Relevant Dependent Variable Score	4.79	1.00	4.88	0.99
Average Income 1994 - 1996 ($10,000	5.39	3.63	5.51	3.81
Log of Average Income 1994 -1996	1.50	0.62	1.52	0.62
(Household Income <$20,000)	0.12	0.32	0.12	0.32
Household Income $20,000 -$34,999	0.19	0.40	0.20	0.40
Household Income $35,000 - $49,999	0.21	0.41	0.21	0.41
Household Income $50,000 - $64,999	0.18	0.39	0.19	0.39
Household Income $65,000 +	0.29	0.45	0.30	0.46
Below LICO (1996) (Yes=1)	0.24	0.43	0.23	0.42
Number of Persons in Economic Family	4.32	1.15	4.37	1.14
Mother's Age at Birth of Child	28.44	4.96	28.22	4.97
Gender of Child (female=1)	0.49	0.50	0.49	0.50
Number of Siblings	1.42	1.01	1.48	1.00
Immigrant Mother (yes=1)	0.16	0.37	0.16	0.37
Mother's Education < High School	0.12	0.32	0.12	0.32
Mother's Education High School	0.20	0.40	0.20	0.40
(Mother's Education Some Post-Secondary)	0.29	0.45	0.30	0.46
Mother's Education Post-Secondary (College/ Trade)	0.24	0.43	0.23	0.42
Mother's Education Post-Secondary (University)	0.16	0.36	0.15	0.36
Mother's Employment Status (Works FT)	0.66	0.47	0.69	0.46
Mother's Employment Status Works Part of the Year	0.08	0.27	0.07	0.26
Mother's Employment Status Does Not Work	0.26	0.44	0.26	0.44
Lone-Parent (Yes=1)	0.16	0.36	0.16	0.37
(Family Structure Change No Change)	0.94	0.24	0.94	0.24
Family Structure Change 2 to 1 Parent	0.04	0.18	0.04	0.19
Family Structure Change 1 to 2 Parent	0.03	0.17	0.02	0.15
Area of Residence (Rural)	0.13	0.33	0.13	0.33
Area of Residence Urban < 100,000	0.24	0.43	0.26	0.44
Area of Residence Urban 100,000 +	0.63	0.48	0.61	0.49

Source: Statistics Canada's National Longitudinal Survey of Children and Youth, 1994/95 and 1996/97, share file

Table 10
Regression Results for Selected Child Outcome Variables by Two Models of Income

	Unstandardized Coefficients B	Standardized Coefficients Beta	Adjusted R-Square	Unweighted N
	Motor and Social Development (0-47 Months)			
Average Income 1994 - 1996	0.469**	0.099	0.01**	2,163
Average Income 1994 - 1996 and controls	0.447**	0.095	0.079**	
Log of Average Income 1994 - 1996	5.849**	0.109	0.012**	
Log of Average Income 1994 - 1996 and controls	6.572**	0.122	0.08**	
Household Income $20,000 - $34,999	0.500	0.014	0.013**	
Household Income $35,000 - $49,999	1.719	0.052		
Household Income $50,000 - $64,999	3.234**	0.088		
Household Income $65,000 +	4.369**	0.133		
Household Income $20,000 - $34,999 and controls	1.324	0.038	0.078**	
Household Income $35,000 - $49,999 and controls	2.386	0.073		
Household Income $50,000 - $64,999 and controls	3.537*	0.097		
Household Income $65,000 + and controls	4.595**	0.141		
Below LICO (1996)	-3.372**	-0.105	0.012**	2,132
Below LICO (1996) and controls	-3.326**	-0.104	0.077**	
	Standard Score for PPVT-R (4 to 5 yrs.)			
Average Income 1994 - 1996	1.178**	0.256	0.070**	3,219
Average Income 1994 - 1996 and controls	0.737**	0.158	0.152**	
Log of Average Income 1994 - 1996	6.600**	0.267	0.074**	
Log of Average Income 1994 - 1996 and controls	4.681**	0.190	0.153**	
Household Income $20,000 - $34,999	3.953**	0.103	0.066**	
Household Income $35,000 - $49,999	6.237**	0.165		
Household Income $50,000 - $64,999	9.039**	0.230		
Household Income $65,000 +	11.640**	0.340		
Household Income $20,000 - $34,999 and controls	3.542**	0.092	0.149**	
Household Income $35,000 - $49,999 and controls	5.834**	0.154		
Household Income $50,000 - $64,999 and controls	7.042**	0.179		
Household Income $65,000 + and controls	7.975**	0.234		
Below LICO (1996)	-7.256**	-0.206	0.044**	3,185
Below LICO (1996) and controls	-4.474**	-0.126	0.145**	
	Hyperactivity - Inattention Score (4-11 yrs.)			
Average Income 1994 - 1996	-0.041**	-0.147	0.022**	9,025
Average Income 1994 - 1996 and controls	-0.021**	-0.077	0.077**	
Log of Average Income 1994 - 1996	-0.244**	-0.153	0.023**	
Log of Average Income 1994 - 1996 and controls	-0.135**	-0.084	0.076**	
Household Income $20,000 - $34,999	-0.173**	-0.069	0.022**	
Household Income $35,000 - $49,999	-0.308**	-0.126		
Household Income $50,000 - $64,999	-0.266**	-0.104		
Household Income $65,000 +	-0.462**	-0.209		
Household Income $20,000 - $34,999 and controls	-0.055	-0.022	0.076**	
Household Income $35,000 - $49,999 and controls	-0.165**	-0.068		
Household Income $50,000 - $64,999 and controls	-0.100*	-0.039		
Household Income $65,000 + and controls	-0.221**	-0.100		
Below LICO (1996)	0.168**	0.072	0.005**	8,919
Below LICO (1996) and controls	0.017	0.007	0.076**	

Table 10 (Continued)

	Unstandardized Coefficients B	Standardized Coefficients Beta	Adjusted R-Square	Unweighted N
	Prosocial Behavior Score (4-11 yrs.)			
Average Income 1994 - 1996	0.010**	0.036	0.001**	5,195
Average Income 1994 - 1996 and controls	0.013**	0.049	0.036**	
Log of Average Income 1994 - 1996	0.065**	0.041	0.002**	
Log of Average Income 1994 - 1996 and controls	0.111**	0.070	0.037**	
Household Income $20,000 - $34,999	0.016	0.006	0.002**	
Household Income $35,000 - $49,999	-0.016	-0.007		
Household Income $50,000 - $64,999	0.066	0.026		
Household Income $65,000 +	0.107**	0.048		
Household Income $20,000 - $34,999 and controls	0.013	0.005	0.038**	
Household Income $35,000 - $49,999 and controls	0.003	0.001		
Household Income $50,000 - $64,999 and controls	0.104*	0.041		
Household Income $65,000 + and controls	0.163**	0.074		
Below LICO (1996)	-0.046	-0.020	0.000**	8,343
Below LICO (1996) and controls	-0.051	-0.022	0.035**	
	Emotional Disorder-Anxiety Score (4-11 yrs.)			
Average Income 1994 - 1996	-0.032**	-0.114	0.013**	9,051
Average Income 1994 - 1996 and controls	-0.019**	-0.069	0.028**	
Log of Average Income 1994 - 1996	-0.187**	-0.117	0.013**	
Log of Average Income 1994 - 1996 and controls	-0.109**	-0.068	0.027**	
Household Income $20,000 - $34,999	-0.098**	-0.039	0.009**	
Household Income $35,000 - $49,999	-0.188**	-0.077		
Household Income $50,000 - $64,999	-0.187**	-0.073		
Household Income $65,000 +	0.305**	-0.138		
Household Income $20,000 - $34,999 and controls	0.048	0.019	0.026**	
Household Income $35,000 - $49,999 and controls	-0.014	-0.006		
Household Income $50,000 - $64,999 and controls	0.007	0.003		
Household Income $65,000 + and controls	-0.064	-0.029		
Below LICO (1996)	0.167**	0.071	0.005**	8,954
Below LICO (1996) and controls	0.068*	0.029	0.026**	
	Aggression Score (Age 4-11 yrs.)			
Average Income 1994 - 1996	-0.025**	-0.090	0.008**	9,023
Average Income 1994 - 1996 and controls	0.018**	-0.064	0.055**	
Log of Average Income 1994 - 1996	-0.172**	-0.107	0.011**	
Log of Average Income 1994 - 1996 and controls	-0.149**	-0.092	0.056**	
Household Income $20,000 - $34,999	-0.182**	-0.072	0.013**	
Household Income $35,000 - $49,999	-0.200**	-0.082		
Household Income $50,000 - $64,999	-0.257**	-0.100		
Household Income $65,000 +	-0.373**	-0.167		
Household Income $20,000 - $34,999 and controls	-0.152**	-0.060	0.057**	
Household Income $35,000 - $49,999 and controls	-0.166**	-0.068		
Household Income $50,000 - $64,999 and controls	-0.229**	-0.089		
Household Income $65,000 + and controls	-0.320**	-0.144		
Below LICO (1996)	0.202**	0.086	0.007**	8,928
Below LICO (1996) and controls	0.120**	0.051	0.052**	

Table 10 (Continued)

	Unstandardized Coefficients B	Standardized Coefficients Beta	Adjusted R-Square	Unweighted N
	Indirect Aggression Score (4-11 yrs.)			
Average Income 1994 - 1996	-0.023**	-0.081	0.006**	8,624
Average Income 1994 - 1996 and controls	-0.014**	-0.050	0.036**	
Log of Average Income 1994 - 1996	-0.140**	-0.087	0.007**	
Log of Average Income 1994 - 1996 and controls	-0.092**	-0.057	0.036**	
Household Income $20,000 - $34,999	-0.056	-0.022	0.008**	
Household Income $35,000 - $49,999	-0.112**	-0.046		
Household Income $50,000 - $64,999	-0.168**	-0.065		
Household Income $65,000 +	-0.258**	-0.115		
Household Income $20,000 - $34,999 and controls	0.017	0.007	0.036**	
Household Income $35,000 - $49,999 and controls	-0.032	-0.013		
Household Income $50,000 - $64,999 and controls	-0.079	-0.031		
Household Income $65,000 + and controls	-0.137*	-0.061		
Below LICO (1996)	0.141**	0.060	0.003**	8,530
Below LICO (1996) and controls	0.092**	0.039	0.035**	
	Property Offences Score (4-11 yrs.)			
Average Income 1994 - 1996	-0.036**	-0.131	0.017**	9,051
Average Income 1994 - 1996 and controls	-0.020**	-0.072	0.058**	
Log of Average Income 1994 - 1996	-0.238**	-0.149	0.022**	
Log of Average Income 1994 - 1996 and controls	-0.154**	-0.096	0.059**	
Household Income $20,000 - $34,999	-0.172**	-0.069	0.024**	
Household Income $35,000 - $49,999	-0.318**	-0.131		
Household Income $50,000 - $64,999	-0.285**	-0.111		
Household Income $65,000 +	-0.484**	-0.219		
Household Income $20,000 - $34,999 and controls	-0.089**	0.035	0.060**	
Household Income $35,000 - $49,999 and controls	-0.204**	-0.084		
Household Income $50,000 - $64,999 and controls	-0.157**	-0.061		
Household Income $65,000 + and controls	-0.309**	-0.140		
Below LICO (1996)	0.273**	0.117	0.014**	8,956
Below LICO (1996) and controls	0.158**	0.068	0.058**	
	Math Scores - Number Correct (10 to 11 yrs.)			
Average Income 1994 - 1996	0.096**	0.097	0.009**	5,786
Average Income 1994 - 1996 and controls	0.044*	0.045	0.029**	
Log of Average Income 1994 - 1996	1.375**	0.100	0.010**	
Log of Average Income 1994 - 1996 and controls	0.704*	0.051	0.029**	
Household Income $20,000 - $34,999	0.353*	0.038	0.008**	
Household Income $35,000 - $49,999	0.554**	0.063		
Household Income $50,000 - $64,999	0.664**	0.071		
Household Income $65,000 +	1.065**	0.135		
Household Income $20,000 - $34,999 and controls	0.268	0.029	0.028**	
Household Income $35,000 - $49,999 and controls	0.388	0.044		
Household Income $50,000 - $64,999 and controls	0.418	0.045		
Household Income $65,000 + and controls	0.570	0.073		
Below LICO (1996)	-0.475**	-0.053	0.003**	5,748
Below LICO (1996) and controls	-0.241	-0.027	0.028**	

Table 10 (Continued)

	Unstandardized Coefficients B	Standardized Coefficients Beta	Adjusted R-Square	Unweighted N
	Reading Scores - Number Correct (10 to 11 yrs.)			
Average Income 1994 - 1996	0.139 **	0.142	0.018 **	5,793
Average Income 1994 - 1996 and controls	0.057 *	0.058	0.059 **	
Log of Average Income 1994 - 1996	2.035 **	0.148	0.018 **	
Log of Average Income 1994 - 1996 and controls	1.040 *	0.076	0.059 **	
Household Income $20,000 - $34,999	0.773 **	0.083	0.015 **	
Household Income $35,000 - $49,999	1.098 **	0.126		
Household Income $50,000 - $64,999	1.344 **	0.126		
Household Income $65,000 +	1.713 **	0.219		
Household Income $20,000 - $34,999 and controls	0.716 *	0.077	0.059 **	
Household Income $35,000 - $49,999 and controls	1.018 **	0.117		
Household Income $50,000 - $64,999 and controls	1.101 **	0.120		
Household Income $65,000 + and controls	1.113 **	0.142		
Below LICO (1996)	-0.804 **	-0.090	0.006 **	5,754
Below LICO (1996) and controls	-0.498	-0.057	0.058 **	
	Home Environment Proxy 1 (2-3 yrs.)			
Average Income 1994 - 1996	0.008	0.024	--	2,087
Average Income 1994 - 1996 and controls	0.004	0.013	0.033 **	
Log of Average Income 1994 - 1996	0.038	0.022	--	
Log of Average Income 1994 - 1996 and controls	-0.003	-0.002	0.033 **	
Household Income $20,000 - $34,999	-0.015	-0.006	0.001	
Household Income $35,000 - $49,999	-0.058	-0.024		
Household Income $50,000 - $64,999	0.081	0.030		
Household Income $65,000 +	0.090	0.037		
Household Income $20,000 - $34,999 and controls	-0.014	-0.006	0.033 **	
Household Income $35,000 - $49,999 and controls	-0.076	-0.031		
Household Income $50,000 - $64,999 and controls	0.036	0.013		
Household Income $65,000 + and controls	0.029	0.012		
Below LICO (1996)	-0.060	-0.025	--	2,062
Below LICO (1996) and controls	-0.036	-0.015	0.031 **	
	Home Environment Proxy 2 (4-7 yrs.)			
Average Income 1994 - 1996	0.079 **	0.255	0.065 **	4,375
Average Income 1994 - 1996 and controls	0.052 **	0.169	0.113 **	
Log of Average Income 1994 - 1996	0.458 **	0.276	0.076 **	
Log of Average Income 1994 - 1996 and controls	0.360 **	0.217	0.118 **	
Household Income $20,000 - $34,999	0.281 **	0.109	0.080 **	
Household Income $35,000 - $49,999	0.355 **	0.138		
Household Income $50,000 - $64,999	0.582 **	0.217		
Household Income $65,000 +	0.870 **	0.373		
Household Income $20,000 - $34,999 and controls	0.249 **	0.097	0.119 **	
Household Income $35,000 - $49,999 and controls	0.292 **	0.114		
Household Income $50,000 - $64,999 and controls	0.455 **	0.170		
Household Income $65,000 + and controls	0.676 **	0.290		
Below LICO (1996)	-0.532 **	-0.225	0.050 **	4,337
Below LICO (1996) and controls	-0.326 **	-0.137	0.107 **	

Table 10 (Continued)

	Unstandardized Coefficients B	Standardized Coefficients Beta	Adjusted R-Square	Unweighted N
	Home Environment Proxy 3 (4-11 yrs.)			
Average Income 1994 - 1996	0.055 **	0.202	0.041 **	8,497
Average Income 1994 - 1996 and controls	0.033 **	0.120	0.080 **	
Log of Average Income 1994 - 1996	0.356 **	0.223	0.050 **	
Log of Average Income 1994 - 1996 and controls	0.259 **	0.162	0.083 **	
Household Income $20,000 - $34,999	0.166 **	0.066	0.054 **	
Household Income $35,000 - $49,999	0.247 **	0.101		
Household Income $50,000 - $64,999	0.434 **	0.169		
Household Income $65,000 +	0.666 **	0.303		
Household Income $20,000 - $34,999 and controls	0.152 **	0.060	0.086 **	
Household Income $35,000 - $49,999 and controls	0.190 **	0.078		
Household Income $50,000 - $64,999 and controls	0.330 **	0.128		
Household Income $65,000 + and controls	0.500 **	0.228		
Below LICO (1996)	-0.406 **	-0.173	0.030 **	8,423
Below LICO (1996) and controls	-0.249 **	-0.106	0.080 **	
	Home Environment Proxy 4 (7-11 yrs.)			
Average Income 1994 - 1996	0.041 **	0.156	0.024 **	5,240
Average Income 1994 - 1996 and controls	0.024 **	0.094	0.058 **	
Log of Average Income 1994 - 1996	0.268 **	0.167	0.028 **	
Log of Average Income 1994 - 1996 and controls	0.190 **	0.119	0.059 **	
Household Income $20,000 - $34,999	0.025	0.010	0.035 **	
Household Income $35,000 - $49,999	0.111 *	0.046		
Household Income $50,000 - $64,999	0.250 **	0.098		
Household Income $65,000 +	0.479 **	0.220		
Household Income $20,000 - $34,999 and controls	0.032	0.013	0.064 **	
Household Income $35,000 - $49,999 and controls	0.071	0.029		
Household Income $50,000 - $64,999 and controls	0.177 **	0.069		
Household Income $65,000 + and controls	0.363 **	0.167		
Below LICO (1996)	0.276 **	-0.117	0.013 **	5,195
Below LICO (1996) and controls	0.157 **	-0.067	0.059 **	

* Indicates that the coefficient estimate is statistically significant at the 5% level

** Indicates that the coefficient estimate is statistically significant at the 1% level

Note: Control Variables: Persons in economic family, mother's age at birth of child, gender of child number of siblings, Immigrant Mother, Mother's Education; Mother's Employment Status, Lone-Parent status, Family Structure Change, area of residence

Source: National Longitudinal Survey of Children and Youth, 1994-95 and 1996-97, share file

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